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A growing body of research on the traumatic impact of disaster (e.g., Norris, Friedman, & Watson, 2002b; Norris et al., 2002a) has led to escalating demand for mental health disaster responders (MHDRs), mental health professionals who help provide emotional support to victims following disaster (American Red Cross, 2012; Spokane, Inman, Weatherford, Davidson, & Straw, 2011). MHDRs are exposed to direct and secondary trauma that may compromise their mental health and, subsequently, the effectiveness of their response (Creamer & Liddle, 2005; Eidelson, D'Alessio, & Eidelson, 2003). Despite the documented prevalence of posttraumatic stress disorder (PTSD) among 10-20% of non-mental health professional disaster responders (Berger et al., 2012; Kleim & Westphal, 2011), no studies completed to date have explored PTSD severity among MHDRs. Additionally, little is known about mechanisms of adaptive coping that may mitigate trauma associated with disaster response work.

Emotion regulation, a vital component of self-managed coping, evolves from healthy and secure attachment relationships in early life (Mikulincer, Shaver, & Pereg, 2003) and, in adulthood, becomes central to adaptive functioning and the development of cognitive abilities that are imperative to successful disaster response work (Diamond & Aspinwall, 2003; Spokane et al., 2011). Elements of mindfulness are woven throughout the four dimensions of emotion regulation (Gratz & Roemer, 2004), which hinge on practices of present moment awareness, nonjudging, patience, and acceptance (Kabat-

Zinn, 1994). Additionally, emotion regulation has been empirically tied to lower rates of PTSD (Ehring & Quack, 2010) – a finding that aligns theoretically with the avoidance model of PTSD symptom development (Thompson, Arnkoff, & Glass, 2011).

A correlational study was conducted to assess the severity of PTSD symptoms among 172 MHDRs and to examine the roles of emotion regulation, adult attachment security, and mindfulness in predicting symptoms of PTSD within this sample.

Independent samples t-tests were used to compare MHDRs' mean PTSD scores to other trauma-exposed groups assessed in previous studies. MHDRs scored significantly lower than all comparison groups on PTSD severity. Multiple linear regression analyses indicated that mindfulness was not a significant independent predictor of PTSD, while emotion regulation and adult attachment security (indicated by the absence of attachment anxiety) were significant independent negative predictors of PTSD. Additional multiple linear regression analyses also supported emotion regulation as a mediator for adult attachment security in predicting PTSD. Study results support the need for additional investigation of MHDRs' trauma risk and indicate that training in emotion regulation skills may reduce the risk of traumatization, particularly among MHDRs with high attachment anxiety.

COPING WITH CATASTROPHE: EMOTION REGULATION, ADULT  
ATTACHMENT SECURITY, AND MINDFULNESS AS  
PREDICTORS OF POSTTRAUMATIC STRESS  
AMONG MENTAL HEALTH  
DISASTER RESPONDERS

by

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To Alex –

“I admit that these answers that I seek  
Are all to questions I’ve never known  
But I pray to keep on looking for as long as I can roam  
And when the world finally fulfills me  
I will not forget my way back home.”

~Dawes

## APPROVAL PAGE

This dissertation has been accepted by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

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## CHAPTER I

### INTRODUCTION

#### **Disaster and Professional Disaster Responders**

A growing body of research on the traumatic impact of disaster (e.g., Norris, Friedman, & Watson, 2002b; Norris et al., 2002a) has led to escalating demand for mental health disaster responders, mental health professionals who help provide emotional support to victims following disaster (American Red Cross, 2012; Spokane, Inman, Weatherford, Davidson, & Straw, 2011). In an effort to mitigate the impact of disaster trauma on others, professional disaster responders willingly expose themselves to some of the most intense, stressful, and overwhelming conditions imaginable. This kind of work requires cognitive acuity, behavioral adaptability, quick and efficient decision-making, and a level of physical and emotional resilience that few possess (Eidelson, D'Alessio, & Eidelson, 2003; Spokane et al., 2011).

Mental health professionals who serve as disaster responders (referred to herein as *mental health disaster responders*, or MHDRs) are exposed not only to the direct trauma of disaster impact but also to secondary trauma from their work addressing the immediate emotional and mental health needs of disaster survivors (Baum, 2011; Bilal et al., 2007). Secondary traumatic stress (STS), trauma-like symptoms experienced by some mental health professionals as a result of working at length with trauma survivors, is a byproduct of exposure to and empathy for their suffering. Due to the nature of their work, MHDRs

are susceptible to a myriad of mental and physical health problems resulting from both direct trauma and STS, referred to by Baum (2011) as a shared traumatic reality.

Although a responder's experience of disaster may differ from that of a survivor, many researchers (e.g., Bober & Regehr, 2006) describe the psychological symptoms involved as remarkably similar.

A wide variety of mental and physical problems have been identified among disaster survivors. Based on a meta-analysis of 155 quantitative studies that assessed psychopathology among disaster survivors, Rubonis and Bickman (1991) reported an estimated 17% increase in psychopathology following a disaster event. Based on their meta-analysis, they ranked the most commonly identified areas of impairment: (a) stress or posttraumatic stress disorder (PTSD), (b) mood disorders, (c) anxiety, (d) somatization or physical health problems, (e) phobia, (f) psychosexual dysfunction, (g) alcohol dependence or abuse, (h) drug dependence or abuse, and (i) psychosis. Among these, the most frequently studied in disaster survivors include PTSD and other anxiety disorders, major depressive disorder, and substance-related disorders (Fullerton, Ursano, & Wang, 2004; Kleim & Westphal, 2011). In particular, PTSD has repeatedly shown up as the most prevalent issue among survivors (Benedek, Fullerton, & Ursano, 2007; Berger et al., 2012; Fullerton et al., 2004; Nucifora, Hall, & Everly, 2011) and the most commonly studied (Benedek et al., 2007; Haugen, Evces, & Weiss, 2012; Meewisse, Olf, Kleber, Kitchiner, & Gersons, 2011; Nucifora et al., 2011; Rubonis & Bickman, 1991).

The hallmarks of PTSD symptom presentation lie in the *diagnostic triad* of intrusion, numbing, and hyperarousal (van der Kolk, 1987). Severe trauma sufferers may

re-experience the traumatic event through intrusive thoughts and images, including flashbacks or nightmares. This can result in a heightened state of arousal and reactivity to even unrelated stressors. The comorbid and seemingly contradictory experience of numbing, or dissociation, also is common among individuals exposed to trauma.

Numbing of thoughts and feelings related to a trauma allows an individual to disconnect from awareness of her or his external and internal experiences, particularly when experiences and emotions become overwhelming (van der Kolk, 1987).

Thus, a person experiencing PTSD may feel pulled between two extremes. At one extreme, uncontrollable, intrusive, and perturbing thoughts, images, and feelings heighten anxiety and physiological arousal, interfering with the ability to function in normal, non-threatening situations. On the other extreme, the same thoughts, images, and feelings may be pushed out of awareness in a self-protective attempt to avoid the anxieties they provoke. The difference lies in one's ability, or lack thereof, to control the ebb and flow of emotions. An individual coping with the symptoms of PTSD experiences trauma-related emotions as all-or-nothing and as beyond her or his control. Accordingly, MHDRs who are affected by symptoms of PTSD would find this emotional deregulation a hindrance to their job responsibilities and detrimental to their personal wellbeing.

PTSD has been emphasized in studies of non-mental health disaster responders (e.g., Fullerton, Ursano, Reeves, Shigemura, & Grieger, 2006), and many researchers choose to focus solely on symptoms of PTSD as indicators of overall stress among this population (e.g., Osofsky et al., 2011; Wang et al., 2011). According to researchers, rates

of PTSD among non-mental health responders trend between 10% and 20% (Berger et al., 2012; Osofsky et al., 2011; Kleim & Westphal, 2011).

To date, however, only a handful of researchers have offered scholarly inquiries into trauma-related stress among MHDRs. Baum's (2011) conceptual piece on shared traumatic reality, aimed at all helping professionals, raises awareness about the inner processes of these individuals during disaster response. Eidelson et al. (2003) presented some of the only available empirical evidence for trauma-related stress among MHDRs. They surveyed psychologists who lived in and around Ground Zero after the terrorist attacks of 9/11 and who provided mental health services to survivors of that disaster. Using a large sample size ( $n = 712$ ), they reported an increase in work-related stress among 57% of their respondents, impact on personal life among 82%, and heightened fearfulness among 72%. Unfortunately, Eidelson et al. (2003) did not include any externally validated measure of PTSD or other mental health diagnosis. Given the lack of quantitative evidence for the prevalence of PTSD among MHDRs, more empirical research is clearly needed to assess the extent of the traumatic impact on this population.

Further, it is possible that STS may pose a greater threat to MHDRs than to non-mental health responders whose role responsibilities do not explicitly include the provision of mental and emotional support to survivors (Creamer & Liddle, 2005). It is important here to first address discrepancies in the literature regarding use of the terms secondary traumatic stress (STS; Figley, 2002) and vicarious trauma (VT; Pearlman & Saakvitne, 1995). Many authors use the terms interchangeably (Buchanan, Anderson, Uhlemann, & Horwitz, 2006; Palm, Polusny, & Follette, 2004; Sommer, 2009). Others

draw a distinction between the impact that working with client trauma can have on a professional's "views of themselves, others, and the world" (VT; Baird & Kracen, 2006, p. 181), and the actual trauma symptoms that result from that impact (STS; Baird & Kracen, 2006; Bober & Regehr, 2006). Using the Secondary Traumatic Stress Scale and the Traumatic Stress Institute (TSI) Belief Scale-Revised to measure STS and VT, respectively, Devilly, Wright, and Varker (2009) found evidence of some convergence between the two constructs ( $r = 0.49, p < .01$ ), although they appear to be distinct. For the purposes of the current study, secondary traumatic stress (STS), "a set of psychological symptoms that mimic post-traumatic stress disorder, but is acquired through exposure to persons suffering the effects of trauma," (Baird & Kracen, 2006, p. 181) will be measured.

Because the symptoms of STS tend to mimic those of direct trauma, it may be nearly impossible to delineate whether measured symptoms of traumatic stress among disaster responders are the result of direct trauma or STS. There is significant evidence of STS and VT (variably defined) among mental health professionals who work with client trauma and stress (Baird & Kracen, 2006a; Buchanan et al., 2006; Devilly et al., 2009; Moulden & Firestone, 2007; Sommer, 2009) and the symptom profile associated with STS is analogous to that of PTSD (Bober & Regehr, 2006; Buchanan et al., 2006; Devilly et al., 2009; Eidelson et al., 2003; Palm et al., 2004; Sommer, 2009). Two of the most popular instruments used for assessing STS are the Impact of Event Scale – Revised (IES-R; Weiss & Marmar, 1997) and its predecessor, the Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979), which were specifically designed to assess for

symptoms of PTSD (e.g., Creamer & Liddle, 2005). Using these instruments, researchers have reported estimated rates of STS/VT anywhere between 10% (Ortlepp & Friedman, 2002) and 50% (Way, VanDeusen, Martin, Applegate, & Jandle, 2004) for trauma counselors who are not involved in disaster response work.

Palm et al. (2004), Rogers (2007), and Tosone (2011) have made solid theoretical arguments for the influence of secondary trauma on mental health professionals who respond to disasters. Only Creamer and Liddle (2005) and Pulido (2012), however, have provided empirical research examining STS among MHDRs. In her exploratory qualitative study, Pulido (2012) concluded that STS was a significant issue among mental health professionals who responded following the terrorist attacks of September 11, 2001 and was exacerbated by lack of disaster experience and mitigated by peer support. Creamer and Liddle (2005) assessed correlates of STS symptoms among 81 MHDRs who responded to the 9/11 terrorist attacks. They found that higher STS was related to heavy past trauma caseloads, lack of professional experience, youth, and discussion of trauma and trauma work in the therapist's own treatment. Longer length of assignment, work with child clients or firefighters, and discussion of morbid material with clients also related to higher STS among Creamer and Liddle's (2005) participants. Although neither study reported exact rates of STS among MHDRs, Pulido (2012) reported "significant STS reactions" (p. 313) and high levels of STS among her sample 30 months after 9/11.

Researchers have measured STS and PTSD separately in different studies, yet they are rarely assessed alongside one another in the same sample. This is largely due to the complexity inherent in measuring these forms of trauma independently within a



dually exposed population. Additionally, the same instruments (the IES and IES-R) are commonly used to measure both constructs. For purposes of this study, STS and PTSD will be assessed in conjunction based on the PTSD symptom profile that characterizes both. Although this approach is limited in its inability to separate STS and PTSD, this is a necessary limitation given existing measures.

### **Mental Health Disaster Responder (MHDR) Role Expectations**

Mental health disaster response differs markedly from traditional therapy in many ways (Spokane et al., 2011). A professional working in the field post-disaster takes on a much different role than he or she would in a more conventional office setting – one that demands flexibility, adaptability, and extensive contingency planning. Professional boundaries must loosen to accommodate the wide variety of demands placed on disaster responders and mental health counseling plays only a small role among those demands.

Several researchers have commented on the unique nature of mental health disaster response work. As part of their study, Eidelson et al. (2003) asked psychologists working in and around Ground Zero after the 9/11 terrorist attacks to comment openly on the types of non-clinical activities they performed in their professional roles during the disaster response period. Respondents reported engaging in psychoeducational activities, providing support to other volunteers, public speaking, and offering quasi-professional support to friends and family. MHDRs who responded following Hurricane Katrina listed among their most prominent job responsibilities the provision of practical, material, and instrumental support, such as retrieving supplies for survivors, distributing food, canvassing neighborhoods door-to-door, and accompanying evacuees when returning to

their homes (Spokane et al., 2011). Rogers (2007), a professional counselor who has engaged in disaster response work, summed the experience up nicely when he wrote, “What I discovered was a need to step back from my advanced training and return to the basic principles of human connection and compassion” (p. 2).

Perhaps, though, it is this compassion for disaster survivors that renders MHDRs more vulnerable to STS than their non-mental health counterparts. In many cases, disaster survivors have lost their very foundations – the social and physical organization of their communities, their families, and their living environments. In this way, disaster produces a community crisis. It has the potential to destabilize on a much larger scale than an individual crisis would, resulting in trauma that is both complex and protracted. MHDRs’ provision of empathy in the midst of such chaos and disorder may assuage disaster survivors’ immediate stress, yet it simultaneously creates an emotional burden for MHDRs. Psychologist Kevin Burns, who has worked for the American Red Cross (ARC) as a mental health disaster volunteer for over 15 years, offered a poignant and vivid description of this burden, “Trauma puts a boulder on people's shoulders. Every time someone gets to tell their trauma story to someone who's empathic, they get to chip away at that boulder; and the person listening gets to carry away that chip” (K. Burns, personal communication, May 30, 2013).

Tasked with providing support and intervention to disaster survivors, MHDRs find themselves caught within Baum’s (2011) shared traumatic reality – simultaneously struck by the impact of secondary trauma and the presence of overwhelming devastation. Buildings and infrastructure may be fractured and disarmingly absent from places where

they should be. Residents of the affected community (which may include some MHDRs) may be disoriented and panicked as they search for signs of stability amidst the chaos. As the uncertainty and insecurity of an unstable environment loom large, the weight of fear becomes palpable. Even in its aftermath, the experience of disaster can trigger self-protective mechanisms on a visceral level. Unlike survivors, however, MHDRs must resist the fight or flight urge and instead remain grounded enough to do their jobs effectively.

Thus, the role expectations that MHDRs face are unique to this type of work and require a different skill set. MHDRs must be able to think quickly and creatively, reason clearly, coordinate, communicate, and act on the fly. Further, they must be able to monitor their own mental and emotional states in order to remain present-minded and protect against long-term impairment resulting from the stress and trauma that disasters can produce (Spokane et al., 2011).

### **Emotion Regulation (ER)**

ER researchers point to emotion as a primary component of intellectual abilities, including reasoning, learning, planning, and perception (Chakraborty & Konar, 2009), as well as coping strategies, problem solving, and mental and physical health (Diamond & Aspinwall, 2003). All of these capabilities are integral to MHDRs' role expectations and require effective emotion regulation. Core to the role requirements, as well as the physical and mental wellbeing of disaster responders, then, is their ability to identify and successfully cope with difficult and overwhelming emotions in the midst of potentially traumatic stressors. At the same time, the affective polarization (intrusion/hyperarousal

versus numbing) that can result from traumatization often leads to emotion deregulation, creating a double bind.

Gratz and Roemer (2004) have broken ER down into four dimensions: (a) awareness and understanding of emotion, (b) acceptance of emotions, (c) ability to engage in goal-directed behavior when experiencing negative emotions, and (d) access to ER strategies perceived as effective (reflects the ability to flexibly and appropriately access and use strategies to actively regulate emotions). ER is akin to the construct of emotional intelligence, which has been correlated with lower PTSD symptom severity among firefighters (Wagner & Martin, 2012). The difference lies in ER's emphasis on active awareness and management of emotions to inform goal-directed behavior. This distinction makes ER a particularly relevant factor to explore in MHDRs who are tasked with completing specific job-related duties while effectively managing their emotional reactions to primary and secondary stressors.

Several researchers have explored the relationship between ER and PTSD and have generated support for a negative relationship between the two, wherein higher levels of emotion regulation relate to lower levels of PTSD (Diamond & Aspinwall, 2003; Ehring & Quack, 2010; Lilly & Valdez, 2012). Conceptualization of ER as a negative predictor of PTSD symptom severity also is consistent with the avoidance model of trauma etiology (Thompson, Arnkoff, & Glass, 2011), which proposes that numbing symptoms are the result of efforts on the part of the traumatized individual to actively avoid and repress thoughts and feelings related to the trauma as a self-protective mechanism. If thoughts and emotions are not effectively processed and assimilated into

the individual's realm of awareness, however, the persistent avoidance can backfire, leading to the opposing symptoms of intrusion and arousal, that is, mental and emotional flooding (Thompson et al., 2011). In this way, suppression of thoughts and emotions related to the trauma (i.e., failure to effectively regulate emotions) often results in the manifestation of traumatic stress (Amstadter & Vernon, 2008).

Failure to regulate emotions effectively in the midst of disaster response renders MHDRs more susceptible to job impairment and long-term mental health consequences, including PTSD and STS. Understanding the factors that influence ER, then, becomes vital to creating a clear picture of how PTSD develops, and how MHDRs can be trained more effectively to maximize role performance and to minimize risk.

### **Adult Attachment Security (AAS)**

Given the evidence for PTSD and STS among MHDRs and the centrality of emotion regulation to the development of related symptoms, it is a logical next step to examine the ways in which humans develop the ability to cope with difficult and overwhelming feelings. John Bowlby's Attachment Theory (AT; 1958) addresses this question. AT posits that humans develop a sense of perceived security in the world and in relationships based upon the relational environments in which they are raised.

Environments characterized by warmth, support, responsiveness, and adequate freedom for exploration yield securely attached individuals who, as adults, tend to be better able to adapt to aversive events (Bowlby, 1958, 1969/1982, 1973, 1980). In the 1970s, Mary Ainsworth and colleagues researched Bowlby's theory extensively and identified three attachment styles in infants based upon their behavioral reactions to being left alone in a

strange and unfamiliar situation: (a) secure, (b) anxious resistant, and (c) anxious avoidant (Ainsworth & Bell, 1970). Ainsworth's colleagues Main and Solomon (1986) later added a fourth style, disorganized/disoriented.

Ainsworth and Bowlby (1991) believed attachment security develops over a person's lifetime based on internal working models of self and other. In the early stages of life, children develop immature dependent security, meaning that they are wholly reliant on adult caregivers for a felt sense of security in the world. Eventually, a healthy, well-adapted adult will come to rely on two types of security: (a) independent security through use of internal coping mechanisms and (b) mature dependent security through use of reciprocal peer relationships as a secure base. These ideas of self and other as trustworthy and reliable sources of coping evolve naturally in a securely attached individual. Conversely, insecure attachment styles in childhood can lead to assessments of self and other as untrustworthy and unreliable, resulting in insecure adult attachment patterns. As with children, failure in adults to adaptively manage feelings of insecurity leads to maladaptive attachment behaviors, including protest (preoccupation with re-establishing security and resistance to others' efforts to reassure), despair (passivity and obvious sadness), and detachment (active, seemingly defensive disregard for and avoidance of others) (Hazan & Shaver, 1987).

Bartholomew (1990) extended Ainsworth and Bowlby's (1991) idea that individual emotional and social adaptation is based on cognitive structures, or working models, of self and others, and postulated that these models can be either positive (self as worthy; other as trustworthy, caring, and available) or negative (self as unworthy; other

as rejecting, uncaring, or distant) (Bartholomew, 1990; Bartholomew & Horowitz, 1991). Bartholomew's conceptualization of adult attachment can be used to better understand how adults cope and adapt in novel or aversive situations, of which disasters would be an extreme example.

Analogous to a large-scale version of Ainsworth's strange situation, one would expect adult attachment mechanisms to be activated during and after a disaster event. If adults exhibit highly anxious or highly avoidant attachment patterns, then one would assume they would be less likely to successfully manage attachment emotions and more likely to exhibit maladaptive attachment behaviors, such as protest, despair, or detachment. In many ways, these behaviors align with the PTSD diagnostic triad of hyperarousal, intrusion, and numbing, respectively. Accordingly, Sroufe (2005) described attachment security as promotive of healthy adult functioning and anxious attachment in infancy as a potential risk factor for psychopathology in adulthood. Empirical evidence supports the theoretical alignment of AAS with PTSD-related symptoms (Declercq & Willemson, 2006; Fraley, Fazzari, Bonanno, and Dekel, 2006). Therefore, an examination of AAS among MHDRs may provide additional insight into the way PTSD and STS develop.

### **Mindfulness**

Mindfulness has garnered growing attention in mental health practice and research as a useful and effective component of trauma treatment. Using cross-sectional and treatment studies, researchers have connected mindfulness skills with decreased symptoms of depression, anxiety, substance abuse, chronic pain, and Borderline

Personality Disorder - all common in those affected by trauma (Vujanovic, Niles, Pietrefesa, Schmertz, & Potter, 2011). Researchers have found correlations between use of mindfulness skills and decreased PTSD symptoms in both clinical and non-clinical populations (Smith et al., 2011; Thompson & Waltz, 2010; Thompson et al., 2011). In addition, a variety of evidence-based treatment protocols incorporating mindfulness techniques and skills training (e.g., Acceptance and Commitment Therapy [ACT], Dialectical Behavior Therapy [DBT], Mindfulness-Based Stress Reduction [MBSR]) are widely used in treatment of PTSD and related trauma symptoms (Vujanovic et al., 2011).

Much of this research was based on the previously referenced avoidance model of PTSD etiology which suggests that the diagnostic triad of PTSD develops as a result of a traumatized individual's efforts to avoid thoughts and feelings related to the traumatic event (Thompson et al., 2011). Theoretically and empirically, it is clear that mindfulness practice might play a pivotal role in trauma prevention by fostering present-centered awareness and nonjudgmental acceptance of distressing internal states and trauma-related triggers (Vujanovic et al., 2011).

### **Evidence for ER as a Mediating Factor**

Scholars have drawn theoretical parallels between attachment security and ER. Bowlby (1958) believed that we first learn to cope with difficult emotions like fear and distress through attachment behaviors in relation to a caregiver. It would follow that secure attachments to self and others predict successful ER strategies. Mikulincer, Shaver, and Pereg (2003) suggested that affect regulation strategies develop through the attachment system and become organized around one's beliefs about the availability and



responsiveness of attachment figures. They argued that maladaptive ER strategies may be the result of negative representations of self and other (high attachment anxiety and avoidance). Diamond and Aspinwall (2003) supported Mikulincer et al.'s (2003) proposition that attachment security may determine patterns of ER in adulthood. Based on theoretical conceptualizations like Mikulincer et al.'s (2003) and Diamond and Aspinwall's (2003), it follows that attachment security may actually affect PTSD more indirectly, as a predictor of ER.

According to Brown and Ryan (2003), "mindful attention and awareness may have its beneficial effects through insight into present realities, a loosening of attachments to outcomes and to a solid sense of self, and greater clarity in thought and action" (p. 844). When considered alongside Gratz and Roemer's (2004) four dimensions of ER (i.e., awareness and understanding of emotions, acceptance of emotions, and ability to engage in goal-directed behavior), it seems that Gratz and Roemer were conceptualizing mindfulness as one component of ER. Among related empirical studies, mindfulness has been associated with better identification and description of feelings (Dekeyser, Raes, Leijssen, Leysen, & Dewulf, 2008), higher ratings of overall wellbeing (Vujanovic et al., 2011), and higher levels of ER (Smith et al., 2011; Vujanovic et al., 2011). Similar to AAS, it is reasonable to hypothesize that the impact of mindfulness on PTSD symptom severity may be better understood with ER as a mediating factor.

Based on the theoretical and empirical evidence detailed above, a conceptual model was proposed for predicting PTSD in which ER serves as a mediator between

AAS and PTSD symptom severity, and also between mindfulness and PTSD symptom severity.

### **Statement of the Problem**

Disaster mental health has seen an exponential growth in empirical study since the early 2000s, yet a curious lack of attention has been paid to the specific and unique experience of serving as a MHDR. Most researchers have focused on disaster survivors (e.g., Norris et al., 2002a, 2002b) and, more recently, an increasing number of researchers have shifted attention to mental health impairment among professional disaster responders in general (e.g., Berger et al., 2012). The professions represented as disaster responders in the literature vary greatly. Among the most commonly identified are police, firefighters, emergency medical personnel, and city workers (Benedek et al., 2007; Berger et al., 2012; Osofsky et al., 2011). Mental health professionals rarely are included among this group despite the fact that they fit the U.S. Department of Homeland Security's (DHS) definition of disaster responders.

Researchers have published only four empirical studies to date that focus exclusively on mental health professionals serving as disaster responders (Bilal et al., 2007; Creamer & Liddle, 2005; Eidelson et al., 2003; Pulido, 2012) and none of these researchers reported specifically on the prevalence or severity of PTSD among this population. The experiences and role expectations of MHDRs clearly are distinct from both mental health professionals in more traditional clinical settings and non-mental health disaster responders (Eidelson et al., 2003; Rogers, 2007; Spokane et al., 2011). MHDRs are a unique group, yet previous researchers have not treated them as such and

have not, heretofore, examined the most commonly studied clinical indicator of traumatic stress, PTSD, among this specific population. Further empirical evidence is needed to conclude whether the patterns and relationships found in studies of non-mental health disaster responders will translate to a population of MHDRs.

In addition, empirical relationships have been found among ER, AAS, and mindfulness (Diamond & Aspinwall, 2003; Mikulincer et al., 2003; Smith et al., 2011; Vujanovic et al., 2011) as well as between each of these factors and PTSD, separately (Diamond & Aspinwall, 2003; Fraley et al., 2006; Vujanovic et al., 2011). These three factors have never been investigated together, however, within a sample of disaster-exposed individuals. Such a study enables further exploration and empirical validation of the relationships among them, as well as generalization of those relationships to MHDRs. Combining ER, AAS, and mindfulness within the same study also allows for testing of potential mediating effects that could ultimately offer a more complex and accurate picture of the way these factors work together to influence PTSD development.

### **Purpose of the Study**

The purpose of this study was to assess the severity of PTSD symptoms among MHDRs and to explore the ways in which three coping-related factors – ER, AAS, and mindfulness – relate to PTSD among this group. This study utilized the available empirical support for ER, AAS, and mindfulness as predictors of PTSD and attempted to replicate the relationships already established in trauma literature with non-mental health disaster responders among a sample of MHDRs. The results of this study may inform

training and support programs for MHDRs by providing evidence for specific skill sets that might reduce the risk of traumatization within this population.

### Research Questions

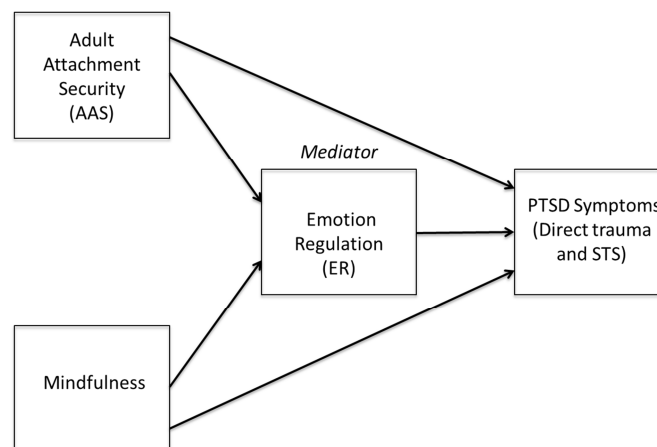
This study explored the relationships between three known predictors of PTSD – ER, AAS, and mindfulness – among a population of MHDRs. It also tested ER as a proposed mediating factor. The following questions were addressed:

Research Question 1: What is the severity of trauma-related symptoms among MHDRs and how does it compare to other trauma-exposed populations?

Research Question 2: How do ER, AAS, and mindfulness independently relate to PTSD and to what extent does each of these factors predict PTSD symptoms among MHDRs?

Research Question 3: What additional factors moderate the relationships between each of the predictor variables - ER, AAS, and mindfulness - and PTSD in a sample of MHDRs?

Research Question 4: Does ER mediate the relationships between a) AAS and PTSD, and b) mindfulness and PTSD among a representative sample of MHDRs?



**Figure 1. Proposed Mediating Model of PTSD Among MHDRs**

### **Need for the Study**

PTSD and STS affect a notable proportion of non-mental health disaster responders (Berger et al., 2012; Osofsky et al., 2011) and trauma-exposed mental health professionals (Ortlepp & Friedman, 2002; Way et al., 2004). Representing one of the only empirical studies to date that assessed stress-related factors among a sample of MHDRs, Eidelson et al. (2003) reported increased work-related stress, significant impact on personal life, and heightened fearfulness among a majority of their participants. Additionally, Creamer and Liddle (2005) and Pulido (2012) reported concern for STS among MHDRs. Unfortunately, researchers have yet to report on the prevalence and severity of PTSD symptoms among this population and explore whether known predictors of PTSD among traumatized populations can be generalized to MHDRs.

Symptoms of traumatization related to emotion deregulation directly conflict with many of the characteristics and skills known to be essential for effective disaster mental health intervention (Chakraborty & Konar, 2009; Diamond & Aspinwall, 2003). Therefore, if MHDRs are experiencing PTSD symptoms in ways that are consistent with related disaster-exposed groups, it is highly likely that their experiences of stress in the field are interfering with their ability to effectively meet role expectations. In addition, direct and secondary trauma, especially among those exposed to multiple disasters, can take a serious toll on long-term physical, mental, and emotional health. If the mental health needs of MHDRs continue to go understudied and unaddressed, it is possible that rates of attrition and burnout, already high among this population, will only escalate. As a result, trained and experienced professionals may suffer unnecessarily and the quality of

mental health care being delivered in the aftermath of disasters may be seriously compromised. With a growing number of disasters being reported in the U.S. and worldwide, this is a significant concern.

Study of specific factors that predict PTSD among MHDRs can fortify existing training programs, enabling trainers to better inform mental health professionals about the risks and protective factors related to disaster response work. Specifically, if the mediating relationships proposed in this study are empirically supported, then trainable skills like ER can be incorporated into training programs to proactively reduce future MHDRs' vulnerability to traumatization. Likewise, empirical support for the proposed relationships could also lead to pre-training assessments of traits like AAS that would increase awareness of trait-related vulnerabilities. Finally, results of this study can inform future intervention studies on resilience enhancement among MHDRs.

### **Definition of Terms**

*Disaster* is defined as an acute, potentially traumatizing event that is collectively experienced (McFarlane & Norris, 2006). There are three categories of disaster: (a) Natural disaster – a disaster that occurs outside of human control, (b) Technological/human-caused disaster – a disaster that occurs as a result of human error or neglect, and (c) Terrorism – a disaster that occurs as a result of human intention to inflict fear and distress (Myers & Wee, 2005).

*Disaster responders* are defined as “(T)hose individuals who in the early stages of an incident are responsible for the protection and preservation of life, property, evidence, and the environment, including emergency response providers... as well as emergency

management, public health, clinical care, public works, and other skilled support personnel... that provide immediate support services during prevention, response, and recovery operations” (U.S. Department of Homeland Security as quoted in Kroll-Smith, Jenkins, & Baxter, 2007).

*Mental health disaster responders (MHDRs)* are licensed mental health professionals who volunteer or contract to provide professional mental health services on-site in the aftermath of a disaster.

*A traumatic stressor* is defined as a first-hand experience or witnessing of an event that involved actual or threatened death or serious injury or a threat to the physical integrity of self or others (American Psychiatric Association [APA], 2013).

*Posttraumatic stress disorder (PTSD)* is a clinical diagnosis defined in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013)* by characteristic symptoms that may occur following exposure to a traumatic stressor. These symptoms include intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity (APA, 2013). In order to meet the criteria for PTSD, these symptoms must have been present for at least one month following exposure to the traumatic stressor (APA, 2013). In the current study, PTSD was measured using the IES-R (Weiss & Marmar, 1997).

*Secondary traumatic stress (STS)* is defined as “a set of psychological symptoms that mimic post-traumatic stress disorder, but is acquired through exposure to persons suffering the effects of trauma” (Baird & Kracen, 2006, p. 181).

*Emotion regulation (ER)* is defined as “the ability to monitor and modulate emotional reactions, especially in the context of goal-directed behavior” (Lilly & Valdez, 2012, p. 611) and was measured using the Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004).

*Attachment theory (AT)* is defined as a theory of social development (Ravitz, Maunder, Sthankiya, & Lancee, 2010) created by John Bowlby (1958, 1969/1982, 1973, 1980) and based on Bowlby’s belief that a child’s first relationships with caregivers influence her or his future wellbeing (Karen, 1998).

*Adult attachment style* is defined as the way in which an adult orients to the world as either safe, secure, and trustworthy or unsafe and threatening based on that individual’s beliefs about self and others (Bartholomew, 1990).

*Adult attachment security (AAS)* is defined as a dimension of adult attachment characterized by positive beliefs about self and others, low attachment anxiety, low attachment avoidance, and the ability to adapt to new and aversive situations (Bartholomew & Horowitz, 1991). It was measured using the two-factor nested model of the Attachment Styles Questionnaire (ASQ) (Feeney, Noller, & Hanrahan, 1994).

*Independent security* is defined as a type of adult attachment security that represents effective use of internal coping mechanisms (Ainsworth & Bowlby, 1991).

*Mature dependent security* is defined as a type of adult attachment security that represents effective use of reciprocal peer relationships as a secure base to aid in coping (Ainsworth & Bowlby, 1991).



*Adult attachment anxiety (dependence)* is defined as a dimension of adult attachment characterized by negative beliefs about self and/or others that can lead to a lack of independent security, an overreliance on others, and inability to cope internally with novel or aversive feelings and situations (Bartholomew & Horowitz, 1991). It was measured using the two-factor nested model of the ASQ (Feeney et al., 1994).

*Adult attachment avoidance* is defined as a dimension of adult attachment characterized by negative beliefs about self and/or others that can lead to a lack of mature dependent security, distancing from external supports, and an inability to effectively use those supports in order to cope with novel or aversive feelings and situations (Bartholomew & Horowitz, 1991). It was measured using the two-factor nested model of the ASQ (Feeney et al., 1994).

*Mindfulness* is defined as an individual's ability to remain aware in the present moment by actively connecting with external and internal experiences, and acknowledging those experiences without judgment (Kabat-Zinn, 1994). It was measured using the Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006).

### **Brief Overview**

This study will be presented over the course of five chapters. The first chapter provides an introduction to MHDRs and their role expectations; prevalence of PTSD and STS among related populations; and an overview of ER, AAS, and mindfulness as they relate to PTSD. This chapter also includes a statement of the problem the study aims to address, the purpose of the study, the research questions, the need for the study, definition

of key terms, and a brief overview of the manuscript. The second chapter includes a review of literature related to the mental health of disaster survivors, non-mental health professional disaster responders, and MHDRs; trauma and its correlates (including PTSD and STS); and known predictors of PTSD that are related to coping, including ER, AAS, and mindfulness. The methodology of the study comprises the third chapter, which includes study hypotheses, a discussion of the participant selection and recruitment process, details about the variables assessed and the instruments used to measure them, and an outline of the study procedures and data analyses. Study data and results are presented in the fourth chapter. Finally, the manuscript ends with a discussion in chapter five of the conclusions to be drawn from study results. Chapter five also includes additional limitations, implications for the counseling field, and suggestions for future research.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

#### **Defining Disaster**

The term *disaster* is widely applied and variably defined. This variance is due, in part, to the inherent difficulty in operationalizing a construct that bridges so many academic disciplines. From natural sciences like meteorology and geology to social and behavioral sciences such as criminology and psychology to the political and legal arenas, researchers who study disaster come from a multitude of different backgrounds and perspectives. The breadth of contributors to this scholarly dialogue grew out of the complexity of the construct itself. What began as the study of major physical disturbances such as earthquakes and floods has developed into a multi-faceted research area that encompasses not only the physical attributes of natural phenomena but also the far-reaching emotional, behavioral, organizational, political, and social implications of those phenomena (Quarantelli, 1987).

Like the scope of scholarly focus, the subject of that focus also has become increasingly ambiguous. Early disaster writers like Rousseau and Voltaire deliberated about whether natural events, such as the 1755 Lisbon earthquake, were in fact “Acts of God” or the unfortunate consequence of human vulnerability and poor decision-making (Dynes, 2000). At that time, any destructive event that was clearly initiated by human will was excluded from the category of disaster and treated as an individual crime or act

of negligence. An unfortunate rash of terrorist attacks, mass shootings, and technological failures in recent decades has blurred the lines of this traditional definition (Myers & Wee, 2005; Quarantelli, 1987). Scholars no longer define the construct of disaster based solely on the physical attributes and origins of a destructive event. Modern disaster researchers accept that the widespread devastation, loss of life, and traumatic impact of a school shooting or a nuclear plant explosion can also be, by definition, disastrous (Myers & Wee, 2005). Three categories of disaster are now generally acknowledged in the scholarly literature: (a) Natural disaster – a disaster that occurs outside of human control (e.g., earthquake, hurricane, flood); (b) Technological/human-caused disaster – a disaster that occurs as a result of human error or neglect (e.g., oil spill, radiation leak, large-scale motor vehicle accident); and (c) Terrorism – a disaster that occurs as a result of human intention to inflict fear and distress (e.g., mass shooting or bombing) (Myers & Wee, 2005).

As the construct of disaster grows in scope and complexity, it has become more challenging than ever to capture the enormity of the construct in a single definition. In 1987, Quarantelli, a sociologist and one of the most prominent disaster scholars of the 20<sup>th</sup> century, drew attention to this conundrum. Referring to the challenges of defining the construct of disaster, he wrote, “there cannot be one all purpose term with a single referent which can meet all needs” (Quarantelli, 1987, p. 22). Rather, Quarantelli (1987) argued that multiple definitions for disaster were necessary to accurately capture such a multifaceted construct. He identified seven general conceptualizations of disaster and asserted that most scholarly definitions of the construct are based on at least one of the

following: (a) Physical agents – the physical characteristics of the event (e.g. earthquake, flood, explosion); (b) Physical impact - physical changes to some part of the environment that result from the event; (c) Assessment of physical impact – a threshold of damages beyond which an event can be called a disaster; (d) Social disruption – a level of disruption to social life and social order beyond which an event can be called a disaster; (e) Social constructions of reality – perceptions of the meaning, significance, and severity of the event; (f) Political definitions - official disaster declarations that affect subsequent actions and assistance; and (g) Imbalance between demand and capability in a crisis – disaster exists when the demands for action exceed the capabilities for response in a crisis (Quarantelli, 1982).

The definition of disaster chosen for the current study hinges on social disruption and alterations to social constructions of reality. Disaster is defined herein as an acute, potentially traumatizing event that is collectively experienced (McFarlane & Norris, 2006). This definition characterizes disaster as a trauma-inducing agent and reflects the study's anticipated contributions to the scholarly dialogue by advancing the psychosocial significance of disaster mental health – an area of disaster study that has gained momentum over the past three decades.

### **Disaster Prevalence**

Although disasters have occurred for centuries, their prevalence and psychosocial impact have drawn increasing media and scholarly attention in recent decades. One reason for this is an apparent rise in the number of reported disasters, with a nearly four-fold increase in disaster events reported worldwide over the past three decades (Spokane

et al., 2011). Another reason is the shift in the types of disasters reported from predominately natural disasters to more technological and terrorist acts in recent years. According to EM-DAT, the International Disaster Database, an average of 394 natural disasters have been reported per year between 2002 and 2011 resulting in an average of 106,816 deaths per year and 267.9 million victims affected per year throughout the world (Guha-Sapir, Hoyois, & Below, 2013). In 2012, EM-DAT recorded 357 disasters in 120 countries (Guha-Sapir et al., 2013). In the U.S. alone, 25 natural disasters were reported in 2012 (the second highest next to China) (Guha-Sapir et al., 2013). Briere and Elliott (2000) conducted a survey study of 935 participants from the general U.S. population and found that 22% of those surveyed had been exposed to at least one natural disaster. EM-DAT only documents natural disasters, so the number of actual disaster events in the U.S. and worldwide is likely much higher. Considering the magnitude of affected populations, the public and mental health consequences of disaster trauma are mounting and the need for trained disaster responders is paramount.

### **The History and Background of Disaster Mental Health Research**

In 1944, following a deadly 1942 fire at the Cocoanut Grove nightclub in Boston, psychiatrist Erich Lindemann published the first empirical study of the mental health impact of disaster on survivors. In his study, Lindemann assessed and described the various reactions of fire survivors to post-disaster grief and loss. Incidentally, Lindemann (1944) was also the first researcher to question whether such reactions constitute psychological diagnosis or ought to more accurately be interpreted as normative responses to an extreme event. Prior to the publication of Lindemann's study, the

majority of writing and research about disasters originated from philosophy and the natural sciences and centered on physical and metaphysical characteristics of disaster events. Lindemann was the first researcher to formally explore the human consequences of disaster and also the first to introduce the study of disaster mental health. Thus, grief was the first indicator of mental and emotional distress to be studied in the context of disaster (Lindemann, 1944).

Tyhurst (1951) expanded on Lindemann's (1944) observations of grief and loss reactions by interpreting them in the context of existing trauma literature and proposing the first stage model of disaster. He suggested that individuals go through three distinct phases in response to experiencing disaster. The initial *period of impact* can last minutes to hours during which those exposed to the disaster experience the most immediate and heightened stress response as they seek physical safety (Tyhurst, 1951). The *period of recoil* begins when immediate physical danger has passed and is characterized by a temporary suspension of intense stress (Tyhurst, 1951). The duration of this phase can vary from person to person and is usually followed by the *posttraumatic period* during which attention shifts to more long-term social consequences of the disaster (Tyhurst, 1951). During this third and final phase, individuals attempt to make meaning of the disaster's impact on their lives and incorporate their post-disaster reality into new schemas (Tyhurst, 1951). According to Tyhurst (1951), the posttraumatic period will typically last for the remainder of an individual's life.

Using information gathered from field interviews of survivors following four disasters in Canada (two large house fires, one marine fire, and one flash flood), Tyhurst

(1951) summarized themes in interviewees' behavioral reactions at each phase. During the *period of impact*, Tyhurst observed three disparate reactions among disaster survivors: (a) 12-15% of survivors seemed "cool and collected," able to maintain awareness, think clearly, and make rational and reasonable decisions without becoming overwhelmed; (b) 75% of survivors appeared "stunned and bewildered," disconnected from their emotions and from aspects of awareness (Interestingly, Tyhurst referred to this majority group as having a "normal" post-disaster reaction); and (c) 10-25% of survivors displayed "inappropriate responses" including extreme confusion, anxiety, and an overall inability to function effectively (Tyhurst, 1951). Interestingly, these three categories seem to parallel the primary dimensions of attachment – security ("cool and collected" response), avoidance ("stunned and bewildered" response), and anxiety ("inappropriate response"). During the *period of recoil*, this wide range of reactions transitioned into a generalized sense of restlessness and security seeking. According to Tyhurst (1951), disaster survivors could be found wandering the streets, looking for shelter, attempting to locate friends and loved ones, or giving their first accounts of their disaster experiences. It was during this phase that many first gained true awareness of the event and began to experience strong emotions of grief, fear, and sadness (Tyhurst, 1951). Finally, in describing survivors' behavior during the *posttraumatic phase*, Tyhurst (1951) reported, "temporary anxiety and fatigue states, psychotic episodes, recurrent catastrophic dreaming" and "depressive reactions" (p. 767). This is one of the first documented accounts of a posttraumatic stress response following disaster.



Despite a lack of methodological rigor, Tyhurst's (1951) contributions to disaster research are pervasive. He was the first researcher to examine disaster as a traumatic force, the first to describe distinct phases of disaster, and the first to highlight individual differences in post-disaster behavioral reactions. Stage models have since become a common and useful way for researchers to understand and evaluate behavioral responses to disaster trauma and evidence of Tyhurst's model can still be found in models used today by the Centers for Disease Control (CDC, 2012).

Following Tyhurst's (1951) empirical foray into the world of disaster mental health, little attention was paid to the subject for the following two decades. It was not until the 1960s and 1970s that Tyhurst's successors in the field of psychiatry returned their focus to the impact of disaster on individual mental health. In an effort to explain this oversight, Hocking (1970) wrote, "One reason for the lack of research in this field has undoubtedly been the difficulty in assessing the degree of stress involved in a particular situation by any means other than a subjective or 'common-sense' judgment" (p. 544). He called upon psychiatrists to turn their focus away from the problems of affluent and higher-functioning individuals toward those who have suffered severe and widespread traumas in the wake of extreme environmental stress. Other researchers (Caplan, 1963; Vosburg, 1971) followed suit, issuing their own calls to action for preventative mental health care in America and increased attention to the mental health problems of society as a whole. Caplan (1963) described mental health as a social responsibility and Vosburg (1971) was one of the first to make an argument for mental

health professionals (specifically psychiatrists) as qualified disaster responders who also were vulnerable to extreme stress responses.

By the latter half of the 1970s, practitioners and researchers seemed to agree that it was imperative to address the mental health needs of disaster survivors. Accordingly, their publications began to read more like a call to arms – evidencing the mental health needs of disaster survivors in an effort to support the mental health disaster response effort that had garnered attention from government organizations such as the National Institute of Mental Health (NIMH). In 1975, Okura published a case study of post-disaster needs following a catastrophic flood in Wilkes-Barre, Pennsylvania. His goal was to provide empirical rationale and support for organized mental health disaster response programs by detailing the development and effectiveness of Operation Outreach, a year-long intervention protocol directed by the NIMH to provide for the mental health needs of the Wilkes-Barre community (Okura, 1975). Okura's was one of the first documented efforts to promote organized post-disaster mental health intervention, and also one of the first since Tyhurst (1951) to note how needs change over time. Specifically, Okura (1975) observed that the most immediate needs of flood survivors in Wilkes-Barre were "concrete needs, most often related to housing" (p. 143). However, after the first three months had passed, he wrote that the needs of survivors shifted markedly to problems with mental health, substance abuse, and an increase in interpersonal disputes (Okura, 1975).

The 1980s brought a new wave of disaster mental health research that addressed a previously neglected problem – the mental health needs of disaster responders.

Researchers such as Wagner (1980), Winget and Umbenhauer (1982), Popkin (1985), and Hartsough (1985) shed light on the stress and trauma reactions experienced by conventional first responders, including firefighters, law enforcement officers, and medical personnel. The late 1980s also saw a rapid increase in the empirical study of mental health problems among disaster survivors as the number of published studies nearly doubled from 1983 to 1986 (Norris et al., 2002a, 2002b).

Empirical study of disaster mental health continued to grow steadily throughout the 1990s until it was suddenly propelled by what many consider to be America's worst national disaster to date – the terrorist attacks of September 11, 2001 (9/11). In the 1990s, researchers used case studies to help consolidate standards of post-disaster mental health practice and develop response guidelines and protocols that could be used to make responses to future disasters more efficient and effective (e.g., Cohen, 1997; Lachance, Santos, & Burns, 1994). Then, 9/11 changed the disaster research landscape completely.

As the first international manmade disaster of its magnitude and impact to occur on American soil, 9/11 shocked the country and many parts of the world into sudden recognition of inherent human vulnerability to disasters. In its wake, researchers flocked to the study of disaster trauma and mental health and the field saw a massive influx of related empirical research. Constructs like PTSD, STS, and posttraumatic growth (PTG) became commonplace vocabulary in the academic dialogue as more traditional qualitative methods of disaster research gave way to quantitative study of operationalized variables (e.g., Eidelson et al., 2003; Decelerq & Willemson, 2006). There seemed to

emerge a new urgency to understand and explain the inexplicable in the midst of one of the most publicized disasters in history.

The post-9/11 world is one in which disasters are more anxiously anticipated and widely publicized than ever before – resulting in a population that is more fearful, vigilant, and dependent on its first responders for a sense of safety in an increasingly unsafe environment. While this reality has certainly brought the study of disaster mental health into the academic spotlight during the last decade, that spotlight has focused primarily on disaster survivors. Where it has been directed at disaster responders, it has shown brightest on those who are most visible – primarily firefighters, law enforcement, medical personnel, and civic officials. Despite a consensus that disaster response work breeds traumatic stress and mental health problems, there remains a curious paucity in the empirical research related to traumatic stress among MHDRs – those specifically tasked with attending to the immediate cognitive and emotional needs of a collectively traumatized group. The following sections detail the current state of empirical research on disaster-related trauma, its impact on disaster responders, and the unique role of MHDRs.

### **Disaster-Related Trauma**

*A traumatic stressor* is defined as a first-hand experience or witnessing of an event that involved actual or threatened death or serious injury or a threat to the physical integrity of self or others (APA, 2013). Depending on its type, scope, characteristics of the impacted community, and individual predispositions and perceptions, the number and

severity of traumatic stressors presented by a disaster can vary greatly from one event to another.

### **Methodology in Disaster-Related Trauma Research**

Because disasters are impossible to control, the empirical study of disaster-related trauma has relied almost solely upon descriptive correlational methodologies in which a large number of disaster-exposed individuals are surveyed to explore predictors of trauma symptoms. Traditionally, disaster researchers have targeted one or two disaster-affected areas with a single study, making generalizability and comparison across different populations quite difficult (Norris et al., 2002a). In the largest meta-analysis to date of research on the psychosocial effects of disaster, Norris et al. (2002a) reviewed some 250 quantitative studies published between 1981 and 2001 and identified several methodological themes and issues. A majority of studies have investigated the prevalence of disaster-related trauma in its many forms as well as risk and protective factors and processes that influence post-disaster mental health (Norris et al., 2002a). Recent themes in research include the effects of disasters globally, children as a high-risk population, and the emergence of the newest category of disaster – terrorism (Norris et al., 2002a). The studies that Norris et al. (2002a) reviewed came out of 29 different countries and included 160 distinct samples, 109 (68%) of which were made up of adult survivors and 24 (15%) of which consisted of disaster responders. They noted that adults and children are usually studied separately. Of the 160 samples, 55% experienced natural disasters, 34% experienced technological disasters, and 11% experienced acts of terrorism (Norris et al., 2002a). Sixty-eight percent of the samples were assessed once post-disaster (Norris

et al., 2002a) and 32% were assessed at two or more time points post-disaster in order to analyze how symptoms of mental and emotional impairment change across time. Ten of these studies had true premeasures – a relatively rare methodological phenomenon given the unexpected nature of disasters (Norris et al., 2002a).

Other aspects of research methodology, including sample size, recruitment, and survey procedures, vary some across studies. The samples Norris et al. (2002a) reviewed ranged in size from 13 to 5,687 with a median of 149 participants. A few researchers have used purposive sampling methods, but most use convenience sampling (Briere & Elliott, 2000; Norris et al., 2002a). Surveys have been administered through many different methods including in-person, telephone, mail, and online (Norris et al., 2002a).

Considering the tendency of trauma-related symptoms to regress over time, the timing of assessments in disaster-related trauma research is significant. In the studies Norris et al. (2002a) reviewed, assessment took place anywhere from immediately to seven years following the disaster event. Sixty percent of the samples were assessed within six months of the event. Only 32 (20%) of the samples reviewed were surveyed using a longitudinal design and, of these, 27 samples showed a notable decrease in symptoms over time (anywhere from one to 17 years post-disaster) (Norris et al., 2002a).

Although Norris et al. (2002a) offer the most comprehensive and succinct summary of literature on the psychosocial effects of disaster to date, their meta-analysis is not all-inclusive. They chose to exclude qualitative and non-empirical studies from their review so that clearer comparisons and summaries could be made. Additionally, trends in disaster research that have evolved over the past ten years, including increasing

emphasis on the mental health needs of disaster responders, are not captured in their comparatively dated snapshot of the state of this research. Yet despite being published over a decade ago, the themes and patterns that Norris et al. (2002a) describe remain remarkably consistent and representative of this body of literature as a whole.

The current study followed precedent for quantitative disaster-related trauma research in its employment of survey-based data collection, convenience sampling, and regression analyses. Whereas a majority of survivor studies have focused on a single disaster event, this study synthesized data across multiple events to which mental health professionals have provided disaster response. This methodological decision was made, in part, out of concern for recruiting a large enough sample for the necessary analyses (a far greater challenge when surveying a specific sector of disaster responders rather than anyone exposed to a particular disaster). This choice also helped to minimize the problem of generalizability that has long plagued the field of disaster trauma research. Data gathered from a variety of responders to a range of different disasters say more about overall patterns in trauma-related symptoms among MHDRs than can be interpreted from responders to a single event. Although it is ideal and also common practice to administer assessments within one year of a disaster event, there is precedent for a longer time frame (Norris et al., 2002a). This was necessarily employed in the current study to account for differences in the timing of disasters to which responders were previously exposed and to maximize sample size. As a result of the retrospective and summative nature of data collection for this study, a true baseline measure of pre-disaster mental health symptoms and trauma exposure was not available. In keeping with recommendations based on

Norris et al.'s (2002a) meta-analysis, participants were assessed for preexisting conditions and analyses controlled for the confounding effects of these variables.

### **Factors That Contribute to Disaster-Related Trauma**

Disaster trauma theory states that many different factors contribute to the impact that a disaster will have on the mental and emotional health of its victims (North, 2003). North (2003) described six factors that can contribute to the severity of disaster-related trauma: (a) the disaster agent, (b) preexisting characteristics of the affected population, (c) characteristics of the affected communities, (d) negative life events occurring after the disaster, (e) individual factors, and (f) personal coping strategies. In addition, individual reactions to disaster-related traumatic stressors can vary widely – from temporary disruptions in sleep to severe flashbacks and nightmares characteristic of a PTSD diagnosis (North, 2003).

**The disaster agent.** The nature of the disaster agent is determined by its origins – in most cases either (a) natural, (b) technological/human-caused, or (c) an act of terrorism (Myers & Wee, 2005; North, 2003). Technological disasters and acts of terrorism both result from human action (sometimes termed *manmade* disasters). The latter category is distinguished by the implication of intention (Norris et al., 2002a).

There is a lack of consensus in the literature regarding which type of disaster holds the greatest potential for trauma as researchers have published conflicting findings. Baum, Fleming, and Davidson (1983) made a solid theoretical case that technological and human-caused disasters may have a greater impact on the human psyche than natural disasters due to differences in the perception of control. They argued that



technological/human-caused disasters involve the breakdown of manmade systems believed to be reliable and predictable and, therefore, result in a loss of felt security and control. On the other hand, natural disasters evolve from forces admittedly beyond human control and are therefore less surprising and disarming. Contrastingly, Norris et al. (2002a) concluded that acts of mass violence (categorized as acts of terrorism) result in the most severe psychological impairment. To confuse the issue further, Rubonis and Bickman (1991), in another meta-analysis of quantitative studies related to disaster psychopathology, found significantly higher impairment estimates among victims of natural disasters compared to those caused, at least in part, by humans.

Although type of disaster (i.e., natural, technological, or terrorist) and specifically the level of human involvement and intentionality underlying a disaster are the most commonly studied disaster characteristics, some researchers suggest that specific elements of a disaster may more accurately predict the severity of posttraumatic stress within the affected population than the type of disaster alone. In a survey study of 935 participants from the general U.S. population, Briere and Elliott (2000) found that specific disaster characteristics predicted trauma symptom severity above and beyond the type of disaster. Specifically, fear of death, injury to self, and loss of possessions correlated more highly with measures of post-disaster psychological impairment than did the nature of the disaster (e.g., earthquake, shooting). Notably, Briere and Elliott (2000) focused solely on different types of natural disasters and did not include comparisons in their analyses of trauma symptom severity among natural, technological, and terrorist disasters. Similarly, in their meta-analysis, Rubonis and Bickman (1991) found that

higher rates of disaster-related deaths more strongly predicted the severity of psychological impairment among survivors than did any other disaster characteristic, including type of disaster (natural versus human-caused).

A majority of disaster-related studies focus only on a single disaster event. All disasters are not created equal, however, and few studies account for potential differences in trauma-related symptoms that may be due to the relative scope, scale, and duration of a disaster. The following ten category disaster scale proposed by Fischer (2003) represents the only known attempt to create a standardized scale of disaster severity that reflects the complexity of a disaster's impact and can also be applied to many different types of disasters. Fischer's (2003) scale is based on the degree of disruption and social structure adjustment that a community or society undergoes as the result of a disaster, taking into account the scale, scope, and duration of that disaster. *Scale* refers to the severity of destruction and distress a community or society experiences as the direct result of a disaster (Fischer, 2003). *Scope* refers to the extent or range of that destruction, whether impacting one area within a community, the entire community, or beyond (Fischer, 2003). *Duration* refers to the amount of time it takes for a community or society to return to normal functioning (or close to a relative baseline of functioning) following disaster impact (Fischer, 2003). No known studies to date have utilized Fischer's (2003) scale in order to compare disaster-related trauma across different disaster events, but it may be a useful tool for future research.

**Table 1*****Fischer's (2003) Disaster Scale Categories***

<b>Disaster Category</b>	<b>Scope, Scale, &amp; Duration</b>	<b>Example</b>
<b>DC-1</b> Everyday Emergency (EE)	Minor in scale, scope, & duration Minor in scope; Major in scale & duration Partial in scope; Minor in scale & duration	e.g., a single home house fire
<b>DC-2</b> Severe Emergency (SE)	Major in scope; Minor in scale & duration Major in scale & duration; Minor in scope	e.g., a house fire that spreads to multiple neighborhoods or a massive snowstorm
<b>DC-3</b> Partial Small Town (PST)	Major scale & duration; Partial scope - Town	e.g., an airline crash in or very near a small town
<b>DC-4</b> Massive Small Town (MST)	Major scale, scope, & duration - Town	e.g., a brush or forest fire that threatens to or actually does destroy an entire community
<b>DC-5</b> Partial Small City (PSC)	Major scale & duration; Partial scope – Small city	e.g., an airline crash in a small or medium sized city
<b>DC-6</b> Massive Small City (MSC)	Major scale, scope, & duration – Small city	e.g., an earthquake that affects the entire city or a bioterrorism event that impacts or threatens the entire city
<b>DC-7</b> Partial Large City (PLC)	Major scale & duration; Partial scope – Large city	e.g., an airline crash that occurred in New York City in November 2001, killing all on board and several on the ground
<b>DC-8</b> Massive Large City (MLC)	Major scale, scope, & duration – Large city	e.g., the 1906 earthquake and fires that destroyed much of San Francisco and seriously impacted nearly all residents of the city
<b>DC-9</b> Catastrophe (C)	Major scale, scope, & duration – Several population areas	e.g., the terrorist attacks of 9/11 that simultaneously involved the World Trade Center, the Pentagon, and the plane crash site in Pennsylvania
<b>DC-10</b> Annihilation (A)	Major scale, scope, & duration - Society	e.g., a massive nuclear attack involving weapons of mass destruction that targets enough population centers to constitute annihilation of a society

**Preexisting characteristics of the affected population.** A significant challenge in conducting research on disaster-related trauma is determining whether any existing traumatic symptoms among those exposed to a disaster are, in fact, the result of that disaster or of previous life experiences. According to the *DSM-5* (APA, 2013), the projected lifetime risk for PTSD by age 75 is 8.7%. Events that lead to symptoms of PTSD and other indicators of trauma-related stress can range from individual abuse, isolated acts of violence, and witnessing severe injury or death to imprisonment, war, and disaster. Considering the lifetime risk of PTSD, not to mention the wide array of other reactions that trauma can induce, we might estimate that at least 8.7% of any disaster-affected population already exhibits symptoms of PTSD or other trauma-related disorders

before the disaster occurs. Previous trauma exposure may predispose some individuals to disaster-related trauma, may exacerbate the trauma response, and may confound study results that are based solely on post-disaster assessment (North, 2003).

Additionally, it is quite difficult for researchers to account for previous trauma exposure and preexisting symptoms when assessing symptoms of disaster-related trauma (Neria, Nandi, & Galea, 2008). Because most disasters occur with little, if any, warning and their radius of impact can never be fully known until after the event, researchers do not have a chance to acquire baseline assessments of any behavioral symptoms among the affected population prior to the disaster's impact. As a result, some researchers make the semantic distinction between discussing "incidence" and "prevalence" of disaster-related symptoms, acknowledging that the word "incidence" falsely implies knowledge that all symptoms were disaster-related (Neria et al., 2008). Instead, Neria et al. (2008) recommend using the word "prevalence" to indicate that the construct being assessed reflects the number and severity of symptoms within a given population and does not assume etiology of those symptoms. Obviously, this distinction limits the generalizability and validity of study results with no baseline measure for comparison. This is one of the most prominent limitations of empirical disaster mental health research.

Because disasters are usually unpredictable and can happen virtually anywhere, most researchers assume equal vulnerability across segments of a population (e.g., socioeconomic status, urban versus rural residence) (North, 2003). The only exception to this is the heightened vulnerability of low socioeconomic groups to floods, as floodplains often are populated by lower income residents who are also more susceptible to mental

health problems (North, 2003). There are some differences in psychopathology among disaster-affected populations in different countries, however. In their meta-analysis, Norris et al. (2002a) found that the location of a disaster seems to affect the severity of psychological impact on the affected population. Specifically, they found that severe or very severe impairment was reported by 25% of American samples, 48% of samples from other developed countries, and 78% of samples from developing countries (Norris et al., 2002a). Developing countries may have more vulnerable infrastructures and often lack the same resources that developed countries have to rebuild and support the needs of the affected population following a disaster (Norris et al., 2002a). Norris et al. (2002a) pointed out that these calculations do not account for the scale, scope, and duration of the disasters investigated, which may have impacted the relative severity of psychological impairment. Also, more time and resources are often needed to study disaster-affected populations in developing countries, making studies of these phenomena sparser.

**Characteristics of the affected communities.** According to North (2003), the ways in which a disaster-affected community reacts as a whole and the ways its members interact with one another during the aftermath of the disaster bear some weight on the long-term psychological implications of disaster trauma for individuals in that community. In his groundbreaking book, *Everything In Its Path*, sociologist Kai Erikson (1976) detailed the complex social phenomena that took place within the small community of Buffalo Creek, West Virginia following a catastrophic flood that all but destroyed the small rural mining town in 1972. Isolated amidst the Appalachian Mountains with little means to relocate, Erikson (1976) details how survivors of the flood

were forced out of their homes and into makeshift housing units provided by the U.S. Department of Housing and Urban Development (HUD) which, in effect, completely reorganized the trauma-struck community. According to Erikson (1976), “The net result of this procedure... was to take a community of people who were already scattered all over the hollow, already torn out of familiar neighborhoods, and make that condition virtually permanent” (p. 47). Based on extensive field research in the Buffalo Creek community, Erikson (1976) documented a wide range of traumatic reactions among flood survivors including symptoms of PTSD (nightmares, numbing, hyperarousal), depression, substance abuse, and relationship strain. He also noted that the forced reorganization of their community appeared to result in more severe distress and a general sense of social unrest (Erikson, 1976). In essence, Erikson (1976) believed that community relationships, social organization, and cultural norms served as stabilizing factors within this small community and that the loss of these factors severely exacerbated the trauma experienced by the Buffalo Creek flood survivors.

Many researchers have found evidence for social support as a moderator of the relationship between a traumatic experience and psychological distress (Brewin, Andrews, & Valentine, 2000). That is to say that an individual who anticipates and/or receives sufficient social support following a traumatic event may experience lower rates of distress than an individual who anticipates and/or receives less social support after the same event. A distinction is made here between perceived social support (the expectation of support from others) and received social support (actual support available), wherein perceived social support seems to have the stronger moderating effect (Norris &

Kaniasty, 1996). Interestingly, in their survey study of 498 victims of Hurricane Hugo and 404 victims of Hurricane Andrew, Norris and Kaniasty (2005) found that the scale of disaster exposure (based on affirmative responses to questions about the presence of injury, threat to life, and financial and personal loss) was positively associated with received support, indicating that those most severely impacted by a disaster may also be those most likely to garner social support. It should be noted, however, that Norris and Kaniasty (1996) only surveyed victims of two similar disasters and that conclusions cannot be drawn from this finding about the impact of overall disaster scale (the severity of disaster impact) on social support.

Mawson (2005) pointed out that the role of social support in moderating psychological distress following a disaster may emerge from instinctual processes. Referencing AT, he noted that a human's natural response to many threats, including disasters, is to seek proximity to familiar people and places, even at the risk of peril (Mawson, 2005). It seems that this instinct may protect some trauma-exposed individuals from severe trauma distress and may be problematic for others whose attachment mechanisms are maladaptive. Specifically, evidence suggests that insecure adult attachment (attachment anxiety and/or avoidance) may be inversely related to perceived social support (Priel & Shamai, 1995).

**Negative life events occurring after the disaster.** Just as traumatic life events that occur prior to a disaster can compound the traumatic stress experienced by disaster victims and survivors (and potentially confound the assessment of trauma-related symptoms), life events that occur after a disaster also can influence the way traumatic

stress manifests. In their epidemiological study of 127 flash fire victims and 55 motor vehicle accident victims, Maes et al. (2001) found that the cumulative number and severity of negative life events following a disaster significantly predicted the rate and severity of PTSD symptoms.

North (2003) and Koopman et al. (1997) noted that disaster survivors can face a myriad of negative life events as a direct result of living through a disaster, including property loss, relocation, personal injury, injury or death of friends and family, job loss, financial crisis, not to mention the mental and emotional stress associated with multiple losses that can be extended over a length of time even after the disaster event has passed. Hobfall's (1989) model of conservation of resources posits that personal and social resources (e.g., shelter, family roles) are vital to psychological wellbeing and that loss of these resources can be destabilizing and create a great deal of stress. Koopman et al. (1997) surveyed 154 survivors of a California firestorm in 1991 and found that loss of a home in the firestorm was significantly related to a number of other negative life events, including major change in living conditions, major business readjustment, and revision in personal habits. They also found that some negative life events that occurred after the firestorm - major personal illness or injury, major change in eating and sleeping habits - were associated with higher rates of dissociative symptoms (Koopman et al., 1997). According to the model of conservation of resources, a disaster survivor who, in the months and years following the disaster, loses her or his home, job, financial status, family role, and possessions would experience an extreme amount of stress from these losses alone, in addition to the trauma of the immediate disaster impact. Complicating the



picture further, it can be quite difficult for researchers to delineate whether a negative life event experienced after a disaster should be considered part of the disaster's impact or separated from it. Regardless, additional trauma and loss certainly affect psychological outcomes in the long run and are nearly impossible to control for in research.

**Personal coping strategies.** The strategies a person uses to cope with difficult or overwhelming situations and the relative effectiveness of those strategies are instrumental in determining how that person will be impacted by a traumatic event. In the case of disaster, the individual who is able to access specific strategies that help her or him remain aware, responsive, and rational in the midst of a chaotic situation is likely to fare far better, physically and psychologically, than someone who lacks adequate coping skills and becomes unable to function. A multitude of factors contribute to the way a person learns to cope. Beginning at birth, an individual's interactions with her or his environment, including early caregivers, continually shape beliefs about self, others, the world, and how that individual will cope with challenging and aversive situations as an adult (Bowlby, 1958). Additionally, many coping skills, including two of the factors central to this study – mindfulness and emotion regulation – can be learned and developed through training and practice.

Coping is an active effort to manage external and internal stressors using cognitive and behavioral strategies (Folkman & Lazarus, 1985). Huijts et al. (2012) noted that the majority of researchers who study coping strategies distinguish between four different types of coping: (a) problem-focused coping – dealing with the sources of stress directly; (b) emotion-focused coping – managing feelings and thoughts related to the

source of stress; (c) avoidant coping – avoiding the source of stress as well as associated thoughts and feelings; and (d) social support seeking – turning to others for support or advice. Problem-focused coping, social support seeking, and active emotion-focused coping (e.g., venting emotions or cognitively reframing a problem) are considered adaptive coping strategies, whereas avoidant coping, including avoidant forms of emotion-focused coping (e.g., denial or self-distraction) are considered less adaptive and can lead to mental health problems if relied upon for an extended period of time (Folkman & Lazarus, 1985; Holahan & Moos, 1987; Schnider, Elhai, & Gray, 2007).

Researchers in the areas of trauma and loss have found that avoidant coping and, in some cases, emotion-focused coping strategies predicted increased severity of PTSD symptoms among American college students (Schnider et al., 2007), veterans of Operation Desert Storm/Shield (Creech, Benzer, Liebsack, Proctor, & Taft, 2013), traumatized refugees (Huijts et al., 2012), victims of intimate partner violence (Lilly & Graham-Bermann, 2010), and witnesses to a terrorist attack (Gil, 2005). Shakespeare-Finch, Gow, and Smith (2005) found that use of active coping strategies (i.e., seeking meaning and mastery following a traumatic incident) predicted higher rates of posttraumatic growth (PTG) and better accounted for positive relationships between certain personality characteristics (extraversion, openness, agreeableness, and conscientiousness) and PTG among 526 emergency ambulance personnel. Similarly, Spence, Nelson, and Lachlan (2009) surveyed 166 residents of Minneapolis, Minnesota in the five days following the 2007 Minneapolis bridge collapse and found that thinking about the collapse was related to lower rates of psychological stress among those

surveyed. It is clear that coping plays an instrumental role in the development of trauma-related distress and psychological impairment and that the specific ways in which a person copes can either exacerbate or mitigate distress.

**Individual factors.** Although disaster differs from most other forms of trauma in that it is experienced collectively, psychological responses to disaster trauma can vary greatly depending on characteristics of the individual. Researchers have examined numerous risk and protective factors that may make certain people more or less likely to experience severe trauma symptoms following a disaster. Unlike coping skills, which are also individually based, most of these factors are fixed and cannot be changed.

In their meta-analysis, Norris et al. (2002a) provided a comprehensive summary of the individual risk and protective factors most commonly studied among disaster survivors. Although published over ten years ago, the factors they identified are consistent with more recent literature (e.g., Mardikian, 2008). Demographic characteristics including gender, age, ethnicity, socioeconomic status, and marital and family status are routinely assessed and have been found to influence severity of trauma-related symptoms following a disaster (Norris et al., 2002a). Of these characteristics, gender seems to have the greatest effect. Forty-nine of the approximately 250 articles Norris et al. (2002a) reviewed yielded a significant gender effect for post-disaster symptoms. In 46 (94%) of these studies, females were more severely affected by the disaster than males, regardless of their country of residence and the type of disaster they experienced (Norris et al., 2002a). One caveat to this otherwise robust finding is that men appear more likely than women to abuse alcohol following exposure to a disaster (Norris

et al., 2002a). Norris et al. (2002a) noted that women seem particularly vulnerable to symptoms of post-disaster PTSD, and that some moderation effects have been found based on culture/ethnicity. Specifically, results of a comparative analysis of victims of Hurricanes Andrew and Paulina showed that Mexican culture exacerbated these gender differences and African-American culture reduced the effect (Norris, Perilla, & Murphy, 2001).

Other demographic characteristics have been found to moderate the impact of disaster exposure on post-disaster psychological stress. Among adults, younger people tend to have a higher risk (Norris et al., 2002a). In the U.S. specifically, middle-aged adults are more severely impacted than either younger or older adults in studies where participants are grouped according to age (Norris et al., 2002a). Ethnicity has been studied less frequently than either gender or age, but existing research makes a case that minority groups are at a higher risk for developing symptoms of post-disaster stress than members of the majority culture (Norris et al., 2002a). Socioeconomic status (SES) may factor into this finding, as some studies have found lower SES to be a risk factor for trauma-related stress (Norris et al., 2002a). Finally, researchers who assessed for effects of marital and family status concluded that being married may increase risk of post-disaster psychological impairment among women and decrease risk among men (Norris et al., 2002a). In general, marital stress tends to increase following disaster exposure and spousal symptom severity seems reciprocally related (Norris et al., 2002a). Finally, being a parent appears to increase risk of psychological impairment regardless of gender or marital status (Norris et al., 2002a).

One of the strongest and most empirically supported predictors of post-disaster impairment is an individual's pre-disaster mental health status (Norris et al., 2002a). Previous mental health diagnosis and previous exposure to trauma are widely studied and have both been strongly associated with more severe post-disaster symptoms (Mardikian, 2008; Rubonis & Bickman, 1991). Those who have been exposed to multiple disasters are particularly likely to experience more severe symptoms with additional disaster exposure (Norris et al., 2002a).

Some researchers have studied the effects of certain personality traits and beliefs on post-disaster traumatic stress. Specifically, individuals who score high on neuroticism, trait worry, and trait anxiety tend to develop more severe stress symptoms (Norris et al., 2002a). Additionally, holding certain beliefs and outlooks may help reduce risk. Higher levels of self-efficacy, mastery, self-esteem, optimism, and hope have been associated with lower rates of symptom severity (Norris et al., 2002a). In a review of disaster literature, Mardikian (2008) also noted that perceived loss of control increases risk.

Although not an individual characteristic, many researchers also assess for the severity of individuals' exposure to a disaster and have found that those exposed to multiple stressors and to certain disaster-related stressors in particular are more likely to experience severe symptoms (Meewisse et al., 2011; Norris et al., 2002a). The general consensus among researchers is that injury to self or other and threats to one's life make an individual particularly vulnerable to severe mental health symptoms (Norris et al., 2002a). Considering that either of these experiences meet criterion A of the *DSM-5* (APA, 2013) diagnostic guidelines for PTSD, it is little wonder that their effect on post-

disaster impairment is so empirically robust. Other stressors known to increase risk of post-disaster traumatic stress include bereavement, the experience of panic or horror in response to the disaster, property damage, financial loss, relocation, and heavy community destruction (Norris et al., 2002a).

### **Reactions to Disaster-Related Trauma**

With so many contributing factors, it is no wonder that the ways in which disaster trauma manifests can vary markedly from one person to another. Exposure to disaster has been linked to short-term stress as well as symptoms of numerous mental health problems and diagnoses. Among them, PTSD is by far the most prevalent and has been used by many researchers as a general indicator of overall impairment among disaster-affected groups. The following sections will detail the prevalence of psychological impairment among disaster-exposed individuals, different views on conceptualizing post-disaster psychological impairment, the symptom profile for PTSD, and considerations for comorbidity and use of PTSD as a general indicator of disaster-related distress.

**Prevalence of psychological impairment among survivors.** In their meta-analysis of existing empirical research on post-disaster psychopathology, Rubonis and Bickman (1991) reported, on average, a 17% increase in psychopathology from pre-disaster levels among survivors surveyed in 52 published studies. Of the 160 disaster-exposed samples they reviewed, Norris et al. (2002a) reported that a majority of their samples (51%) endorsed moderate psychological impairment (rates of psychopathology 25% or lower) post-disaster, 21% of their samples experienced severe impairment (rates of psychopathology between 25% and 50%), 18% experienced very severe impairment

(rates of psychopathology above 50%), and only 11% of samples endorsed minimal impairment (transient stress that did not meet full diagnostic criteria for any mental health diagnoses).

The CDC contends that most disaster-exposed individuals will not experience severe or long-lasting mental health symptoms (CDC, 2012) and, based on evaluation of longitudinal studies, Norris et al. (2002a) asserted that symptom severity for most will peak within one year following the disaster and then gradually remit. In general, it seems that most disaster survivors likely experience moderate to severe psychological impairment that gradually lowers in severity after one year. Some may experience only minimal stress, and others are affected more severely for a longer period of time. Norris et al. (2002a) observed that early onset symptom severity often was indicative of symptom persistence. In other words, more severe symptoms within the first six months after a disaster predicted more severe symptoms in later stages of recovery. They also noted that, although there are exceptions, late-onset psychological problems were rare (Norris et al., 2002a). Although conclusions drawn from their meta-analysis do not clearly account for differences in the time point of post-disaster assessment, Norris et al. (2002a) reported that 60% of their 160 samples were surveyed within six months of the disaster and the general trends they observed in patterns of post-disaster psychopathology are consistent with findings from other meta-analyses and literature reviews in the field (Galea, Nandi, & Vlahov, 2005; Rubonis & Bickman, 1991).

**Adaptive response or psychological disorder?** Any level of trauma exposure will cause some emotional unrest and interruptions to normal functioning. There is strong

evidence that disaster-related stress can, and in many cases does, result in symptoms that meet diagnostic criteria for mental health disorders. There are, however, some researchers who question whether these symptoms should be viewed as true psychological disorder or whether they might be better explained as reasonable and expected human responses to extreme stress and trauma.

Lindemann (1944) was one of the first to raise this question and many since have perpetuated it. North (2003) noted that some models of post-disaster mental health adopt a “one-size-fits-all” (p. 42) approach, meaning that they consider all responses to disaster-related stress to be either normal responses to abnormal events or indicative of psychopathology and in need of clinical intervention. Others call for more flexibility in conceptualizing distress and intervention after a disaster, acknowledging that minimal clinical intervention and/or increased social support may be sufficient to return a majority of those exposed to adaptive functioning (North, 2003). These adaptive models of traumatic stress call for individual assessment of needs and referral for ongoing clinical treatment only in cases where symptoms are severe or persistent.

This debate is ongoing and its relevance to the current study is two-fold. One purpose is to highlight the range of responses that may emerge following disaster exposure. One might consider these responses on a continuum, where transient or minimal stress (e.g., mild insomnia, worry, upset) represents one extreme and severe persistent psychological impairment (e.g., symptoms meeting full diagnostic criteria for major depression or PTSD) represents another. Many (probably most) disaster-exposed individuals will fall somewhere between the two and many will exhibit symptoms of one



or more *DSM-5* (APA, 2013) disorders without meeting full diagnostic criteria. Although the current study will assess MHDRs for levels of symptom severity that may indicate a PTSD diagnosis, the instrument being used to assess these symptoms (IES-R; Weiss & Marmar, 1997) is not a diagnostic tool and can only be used to measure relative severity of symptoms related to PTSD. This is true among many instruments used by researchers to assess for psychological impairment among disaster-exposed groups.

Another purpose of raising the debate about whether or not disaster-related stress constitutes psychopathology is to point out an important distinction in how trauma sufferers are conceptualized. Categorical models would indicate that most are impaired to some degree, which may raise questions about their ability to think, act, and function effectively. Viewing symptom severity on a continuum, however, implies that there is no cutoff point beyond which an individual is labeled “impaired.” Many may endorse multiple symptoms of PTSD and other disorders but still be able to maintain responsibilities and to function at a pre-disaster level. Others may become seriously impaired and unable to function normally. This distinction becomes particularly salient when considering the demands of MHDR work, which will be detailed in subsequent sections.

**Posttraumatic Stress Disorder (PTSD).** PTSD is a clinical diagnosis defined in the *DSM-5* (APA, 2013) by characteristic symptoms that may occur following exposure to a traumatic stressor. These symptoms include intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity (APA, 2013). In order to meet the criteria for PTSD, these symptoms must have been present for at least one

month following exposure to the traumatic stressor (APA, 2013). *Intrusion* symptoms may include recurrent, involuntary, and intrusive memories of a traumatic event, nightmares about the event, flashbacks to the event during which a person feels as if he or she is re-experiencing the trauma, and physiological or psychological distress in response to stimuli (i.e., places, people, things) associated in some way with the event (APA, 2013). *Avoidance* symptoms may include any measure taken to avoid thoughts, feelings or memories closely associated with the traumatic event or efforts to avoid things, people, or situations reminiscent of the event (APA, 2013). *Negative alterations in cognitions and mood* may include the inability to remember aspects of the traumatic event; persistent and exaggerated negative beliefs about oneself, others, or the world; distorted cognitions about the cause or consequences of the event that lead to self-blame; persistent negative emotions; decreased interest in activities; feelings of detachment or estrangement from others; and the persistent inability to experience positive emotions (APA, 2013). Finally, *alterations in arousal and reactivity* may include irritable behavior and angry outbursts, reckless or self-destructive behavior, hypervigilance, exaggerated startle response, problems with concentration, and sleep disturbance (APA, 2013).

Symptoms of PTSD lasting for more than two days and less than one month may be diagnosed as Acute Stress Disorder (ASD) (APA, 2013). ASD has rarely been studied as an indicator of post-disaster psychological impairment because of its short duration and also because some researchers have mislabeled ASD symptoms as PTSD when assessment actually took place less than one month post-disaster. Needless to say, the prevalence of ASD is relatively unknown despite the likelihood that it may be among the

most prevalent disaster-related traumatic outcomes (Fullerton & Ursano, 1997). Because many disaster survivors experience symptoms that are minimal to moderate (Norris et al., 2002a), the severity of these symptoms may diminish so much in the first month that they no longer meet diagnostic criteria for PTSD after four weeks.

PTSD is undoubtedly the most researched and most prevalent stress-related diagnosis identified among disaster-exposed populations (Fullerton et al., 2004; Meewisse et al., 2011; Norris et al., 2002; Nucifora et al., 2011; Rubonis & Bickman, 1991). The prevalence of PTSD among disaster survivors typically ranges from 30-40% (Galea et al., 2005). Norris et al. (2002a) found some evidence for PTSD among 109 (68%) of the 160 disaster-exposed samples that they reviewed. According to Norris et al. (2002a), intrusion and arousal symptoms tend to be more prominent than avoidance symptoms in disaster-exposed samples, and the severity of PTSD symptoms tends to increase with higher levels of exposure and multiple stressors.

Many researchers explain the development of PTSD symptoms among traumatized individuals using the avoidance model of PTSD. This model posits that the avoidance symptoms that characterize the diagnosis develop out of an unconscious effort by the trauma victim to distance her- or himself from the difficult thoughts, emotions, and experiences associated with the trauma (Orsillo & Batten, 2005; Thompson et al., 2011). This is, in effect, a self-protective mechanism designed to ward off internal states that may be overwhelming and would otherwise disable the individual, rendering her or him unable to function. At times this mechanism breaks down, resulting in flooding of trauma-related thoughts and feelings that characterizes the intrusion symptoms of PTSD

(Orsillo & Batten, 2005). The fear of these intrusive symptoms then reinforces the avoidance symptoms and the traumatized individual becomes split – unable to safely experience authentic thoughts and emotions about the trauma or to process them effectively (Thompson et al., 2011). This splitting heightens anxiety around the traumatic experience and can contribute to arousal symptoms. This model has been used to explain the correlation between avoidant coping and heightened PTSD symptom severity and to support the use of mindfulness-based interventions in the treatment of PTSD (e.g., Acceptance and Commitment Therapy) (Orsillo & Batten, 2005). Based on the avoidance model, it follows that difficulties in ER, low aptitude with mindfulness skills, and a propensity for maladaptive coping would be associated with increased PTSD severity in a traumatized individual.

Because of its prevalence and symptom specificity, many researchers have used measures of PTSD alone as indicators of disaster-related traumatic stress among disaster survivors and responders (Brewin et al., 2000; Osofsky et al., 2011; Wang et al., 2011). Acknowledging that there is a high rate of comorbidity, PTSD is more closely associated with trauma than any other specific diagnosis. Its diagnostic criteria assume exposure to a threatening event, which, in theory, increases the likelihood that symptoms specific to PTSD are the result of the disaster event and not a preexisting condition. As mentioned previously, there is no way to conclusively delineate symptoms that resulted from a particular disaster from preexisting symptoms or those that resulted from post-disaster trauma. Limiting empirical assessment to symptoms of PTSD, however, may create a clearer clinical profile.

**Comorbidity and other stress-related problems.** Other stress-related problems and mental health diagnoses also have been identified in studies of post-disaster stress. Specifically, depression, substance abuse, other anxiety disorders such as specific phobia and panic disorder, somatization, and adjustment disorders are the most commonly reported after PTSD (Fullerton & Ursano, 1997; North, 2003). Norris et al. (2002a) reported that symptoms of depression were the second most commonly observed psychological problem among the samples they reviewed. In their meta-analysis, Rubonis and Bickman (1991) reported that anxiety disorders and substance abuse problems were most prevalent after PTSD. They also noted that psychosexual dysfunction and psychosis have been related on rare occasions to post-disaster stress (Rubonis & Bickman, 1991).

In light of the range of responses mentioned above, comorbidity among those exposed to disaster is quite common (Fullerton & Ursano, 1997). Meewisse et al. (2011) surveyed 260 survivors of a fireworks disaster at 2-3 weeks post-disaster and again at 2 years and 4 years. They found that, at 2 years post-disaster, PTSD (21.9%), specific phobia (21.5%), and depression (16.2%) were the most prevalent psychological disorders assessed and that comorbidity remained high, with 24.1% of survivors endorsing criteria for two or more disorders (Meewisse et al., 2011). At 4 years post-disaster, Meewisse et al. (2011) observed that 41.8% of survivors in their sample who previously met criteria for PTSD, depression, and/or specific phobia (the three most prevalent disorders identified in this sample) still met criteria for at least one of these disorders.

### **Trauma and Professional Disaster Responders**

Professional disaster responders are “(T)hose individuals who in the early stages of an incident are responsible for the protection and preservation of life, property, evidence, and the environment, including emergency response providers... as well as emergency management, public health, clinical care, public works, and other skilled support personnel... that provide immediate support services during prevention, response, and recovery operations” (U.S. Department of Homeland Security as quoted in Kroll-Smith et al., 2007). Unlike survivors and lay responders (disaster survivors who take action during a disaster to help save lives, provide medical care, and meet other basic needs), professional disaster responders have a unique responsibility to carry out specific jobs in the midst of the chaos and trauma of disaster. They must be able to think logically and flexibly, attend to and manage their own emotional reactions without becoming overwhelmed by them, and act in a rational and goal-directed manner that is informed by input from an environment that can change at any moment (Spokane et al., 2011). Considering that the natural human response to disaster is to seek comfort, security, and safety, responders must essentially fight instinct to help maintain order.

### **PTSD Among Professional Disaster Responders**

Adults from many different backgrounds serve as professional disaster responders and a small body of literature has explored the psychological consequences of serving in this role. Most academic literature to date focuses on law enforcement officials, firefighters, medical personnel, and rescue and recovery workers, with just a handful of researchers including mental health professionals among this group and even fewer

studying MHDRs as a separate population. The following review details current research on PTSD among professional disaster responders in general, followed by a summary of research on the mental health impact of disaster response on MHDRs in particular.

Many researchers have assessed the prevalence of mental health problems, specifically PTSD, among professional responders in general (e.g., Berger et al., 2012, Kleim & Westphal, 2011). This attention comes from concern that responders, more than other professionals, are exposed to death, injury, and trauma on a regular basis (Benedek et al., 2007). Additionally, the public's health and safety relies heavily upon their ability to perform their jobs intentionally and effectively, even under extreme stress (Benedek et al., 2007). This double bind makes professional disaster responders particularly vulnerable to traumatic stress and its mental health consequences and raises the public's stake in their care.

Berger et al. (2012) conducted a literature review and meta-regression analysis of the worldwide current prevalence of PTSD among rescue workers (defined as “any person who professionally or voluntarily engages in activities devoted to providing out-of-hospital acute medical care; transportation to definitive care; freeing persons or animals from danger to life or well-being in accidents, fires, bombings, floods, earthquakes, other disasters and life-threatening conditions” [p. 1001]). They reported a pooled current prevalence of 10% based on review of 28 studies with 40 samples, but noted that this rate varies greatly depending on several factors (Berger et al., 2012). Specifically, geographical location, occupational group, and average age at time of assessment were significant predictors of PTSD symptoms (Berger et al., 2012). Rescue

workers in Asia reported higher rates of PTSD (17.9%) than those working in Europe (7.4%;  $\beta = 1.10$ ,  $p = .02$ ), but not those in North America (11.9%;  $\beta = 0.57$ ,  $p = .21$ ; Berger et al., 2012). Ambulance personnel had a higher rate of PTSD (14.6%) than did firefighters (7.3%  $\beta = -0.80$ ,  $p = .04$ ) or police officers exposed to a major disaster (4.7%;  $\beta = -1.22$ ,  $p = .04$ ; time since disaster not reported) (Berger et al., 2012). Finally, younger mean age of rescue workers was associated with higher prevalence of PTSD symptoms ( $\beta = -0.05$ ,  $p = .04$ ) (Berger et al., 2012). Berger et al. (2012) did assess for differences in PTSD prevalence based on disaster exposure within their sample. Rates of PTSD among rescue workers exposed to a natural disaster (17.2%), a manmade disaster (7.7%), and no disaster (9.6%) were not statistically different, although these calculations do inform estimates of PTSD prevalence among disaster-exposed rescue workers.

Kleim and Westphal (2011) conducted a review of key quantitative studies of the mental health of first responders (i.e., firefighters, ambulance workers and other emergency medical personnel, utility workers, rescue and recovery workers, and unspecified disaster workers). Although many of the studies reviewed were not specific to disaster response (only two were specific to disaster workers), they found that PTSD and depression were the most prevalent disorders assessed among first responders, with rates of PTSD ranging from 8% in a study of emergency personnel to 37% among a sample of ambulance workers (Kleim & Westphal, 2011). Both studies of disaster workers (Fullerton et al., 2004; Fullerton et al., 2006) found rates of PTSD above 20% (26% and 22%, respectively), positioning disaster workers among the first responders most affected by PTSD, according to Kleim and Westphal's (2011) review.



Fullerton et al. (2004) compared rates of ASD, PTSD, and depression among 207 disaster workers 2, 7, and 13 months following exposure to a severe airline accident that involved numerous deaths and injuries to a comparison group of 421 non-exposed workers from a similar sized community. They reported significantly higher rates of ASD among the disaster-exposed group at 2 months (25.6% compared to 2.4% among the comparison group,  $p = .01$ ), higher rates of depression among the disaster-exposed group at 7 months (16.4% to 10.0%,  $p = .05$ ), and higher rates of both PTSD and depression among the disaster-exposed group at 13 months (16.7% to 1.9% for PTSD,  $p = .01$ ; 21.7% to 12.6% for depression,  $p < .03$ ) (Fullerton et al., 2004). Effect sizes were not reported. Although at first glance the finding of a delayed spike in comparative PTSD severity seems inconsistent with survivor research that indicates very low likelihood of late onset symptoms following disaster, a methodological issue in Fullerton et al.'s (2004) study may clarify this finding. The authors reported their highest prevalence of trauma-related symptoms for ASD (25.6%) at 2 months post-disaster. However, ASD cannot be accurately diagnosed more than 1 month following exposure to a traumatic stressor. They clarify that participants were assessed for ASD specifically for the week following the disaster, yet the assessment still took place long after that time and, considering the inherent error involved in retroactive recall, may more accurately reflect symptoms of PTSD than ASD. If this is the case, then some symptoms of PTSD may have been present as early as 2 months following the disaster. Fullerton et al. (2004) noted that they only assessed for PTSD specifically (using the *DSM* PTSD-IV Scale) at

13 months due to practical considerations regarding survey length and their self-acknowledged interest in PTSD primarily as a long-term outcome.

Fullerton et al. (2006) conducted a correlational study of 89 disaster workers 2 weeks following the 9/11 terrorist attacks. Disaster workers in this study included medical personnel, police, firefighters, search and rescue workers, and other unspecified disaster site workers. The researchers' stated goal was to examine the relationships between perceived safety and symptoms of PTSD, depression, peritraumatic dissociation, and social support among professional disaster responders (Fullerton et al., 2006). They used chi-square and t-test analyses to evaluate main effects. They reported, based on a IES-R cutoff score of 22.3, that 22.5% of their sample was at a level of clinical concern for PTSD (Fullerton et al., 2006). They also concluded, based on their analyses, that perceived safety was inversely associated with disaster exposure (determined based on participants' report of witnessing a death or working with dead bodies, working with survivors or their families, or being injured during the attacks); prevalence of PTSD, depression, and dissociation symptoms; and intrusion and hyperarousal (but not avoidance) symptoms of PTSD (Fullerton et al., 2006).

Although these results make intuitive sense and would otherwise support a possible connection between AAS (as indicated by perceived safety) and PTSD, once again methodological issues bring the validity of these results into question. First, Fullerton et al. (2006) assessed specifically for symptoms of PTSD using the IES-R. The assessment, however, took place 2 weeks following 9/11, which would indicate ASD rather than PTSD. Although the two share a very similar symptom profile, the IES-R was

designed to assess for PTSD and a measure specific to ASD would have been more accurate in this case. Second, Fullerton et al. (2006) used a cutoff score to indicate clinical concern based on total IES-R scores. They cited evidence for this in articles pertaining to the original version of the instrument rather than the revised version, and verification of the 22.3 cutoff score could not be located in either of these sources (Horowitz et al., 1979; Zilberg et al., 1982). Third, the authors stated that they were assessing relationships between these variables, yet the chi-square and t-test analyses are designed to determine differences between groups rather than relationships (Howell, 2010). It seems that regression analyses would have been more appropriate to the research questions and more consistent with common methodologies in disaster research.

Considering the methodological questions raised in these two studies, further evidence is needed to establish reliable estimates of PTSD prevalence and severity among disaster responders specifically. Osofsky et al. (2011) conducted a longitudinal study of 1,382 professional disaster responders who were involved in the response to Hurricane Katrina in 2005. Their sample included police, fire, emergency medical services, and city workers surveyed at two time points (6-9 months post-disaster and 13-18 months post-disaster) for symptoms of PTSD and other indicators of mental health problems (e.g., self-report of distress, help-seeking behavior) (Osofsky et al., 2011). PTSD was assessed using the PTSD Checklist Civilian Version (PCL-C). Osofsky et al. (2011) reported that approximately 10% of their sample met cutoff criteria (score of 50 on the PCL-C) for PTSD diagnosis at both time points and that roughly 20-30% endorsed PTSD symptoms of re-experiencing, avoidance, and hypersensitivity at both time points. Additionally,

participants reported experiencing significant losses and stressors, including loss of home, separation from family, and stressful working conditions (Osofsky et al., 2011). Wang et al. (2011) also investigated rates of PTSD among military personnel who served as disaster responders following the Wen Chuan earthquake in China in 2008. Using the Davidson Trauma Scale (DTS) to measure PTSD, they surveyed 1,056 participants roughly 6 months following the earthquake and reported that 69 of their participants (6.5%) met the cutoff score (40 for the DTS) for PTSD diagnosis (Wang et al., 2011).

When compared with Osofsky et al.'s (2011) and Wang et al.'s (2011) findings, Fullerton et al.'s (2004, 2006) estimates of PTSD prevalence among professional disaster responders may have been a bit high. There is, however, clear evidence that these individuals are experiencing stress, loss, and subsequent impairment characterized by symptoms of PTSD (even if full diagnostic criteria are not met) and job stress. It appears that, in the context of considerable heterogeneity among professional first responders (PTSD rates ranging from below 10% to more than 30%), the evidence for PTSD prevalence among professional disaster responders in particular is more conclusive and generally falls between 10% and 20%. These numbers are consistent with observations by other researchers that mental health impairment among professional disaster responders follows similar patterns as in survivors (PTSD prevalence between 30-40%), although with lower severity (Baum, 2011; Bilal et al., 2007). Considering the responsibility of professional disaster responders to remain focused on their work, manage stress effectively, and think and act adaptively under extreme duress, these numbers reflect a notable public health concern.

### **Mental Health Disaster Responders (MHDRs)**

MHDRs are a specific group of professional disaster responders - licensed mental health professionals who volunteer or contract to provide professional mental health services on-site in the aftermath of a disaster. The number of MHDRs in the U.S. and elsewhere is not explicitly known, although a growing body of research on the importance of disaster mental health care has paved the way for increased media attention and an influx of mental health professionals interested in contributing to disaster response. ARC, the largest disaster response organization worldwide, along with many other response organizations (e.g., the U.S. Federal Emergency Management Agency [FEMA] and National Organization for Victim Assistance [NOVA]) now regularly employ licensed mental health professionals on disaster response teams and professional organizations such as the American Counseling Association (ACA) and the APA have initiated active disaster response networks of professional volunteers, ready to respond when a disaster occurs. Upon its inception in 1990, ARC's Disaster Mental Health (DMH) program had less than 100 registered personnel which ballooned to over 4,000 disaster mental health volunteers by the time Hurricane Katrina struck the U.S. in 2005 (Cronin, Ryan, & Brier, 2007).

Although they fulfill many of the same duties in the field as other professional disaster responders, the role of MHDR is unique. MHDRs are tasked specifically with providing mental and emotional support to disaster survivors, providing psychological first aid (Ruzek et al., 2007), and serving as a safe base to help stabilize the overwhelming thoughts and emotions that plague survivors in the days, weeks, and even

months following a disaster (Spokane et al., 2011). In previous U.S. disasters, MHDRs were called upon to provide psychotherapy (both formal and informal) following 9/11 and Hurricane Sandy, to comfort friends and families of victims following the 1999 Columbine High School shootings, and to support families of firefighters and police officers missing in action after the 9/11 terrorist attacks (K. Burns, personal communication, May 30, 2013; Eidelson et al., 2003; Levy et al., 2004; Zezima & Barr, 2012). In addition, MHDRs often are called on to fulfill instrumental tasks such as provision of food, water, and clothing and supervision of children (V. Arnold, personal communication, September 10, 2012; Spokane et al., 2011). Like other professional disaster responders, they must be able to think rationally, adapt quickly, communicate clearly, and manage their own internal reactions to the stress of disaster exposure and fieldwork in order to perform their jobs effectively (Spokane et al., 2011).

Most MHDRs are associated with a state or national response organization and are trained by that organization for disaster response work. For example, ARC requires MHDRs to complete a series of online classes before they are eligible to respond to a disaster (ARC, 2012). They are then deployed by ARC when their services are needed (ARC, 2012). MHDRs usually receive the call to respond within days of a disaster event and may report to the site of the disaster within days or weeks. Typical deployments for ARC MHDRs last approximately 2 weeks or less (V. Arnold, personal communication, September 10, 2012).

The response time frame is one other notable difference between MHDRs and other professional disaster responders - a difference that could readily affect PTSD

severity. Unless they are members of the affected community, most MHDRs do not arrive on the scene until the most immediate impact of the disaster has passed.

Conversely, professionals included in studies of other professional disaster responders, including police, firefighters, and medical personnel, are far more likely to (a) be a member of the affected community, (b) be exposed directly to the disaster's greatest point of impact, and (c) be exposed to injury, death, and destruction under more sudden and severe circumstances.

Eidelson et al. (2003) conducted one of the only empirical studies to date of MHDRs. They surveyed 712 licensed psychologists practicing in or near the sites of the 9/11 terrorist attacks 3-5 months following the attacks to learn about their experiences providing professional support services to those directly affected (Eidelson et al., 2003). The researchers provided participants with a self-designed survey that included 15 questions about participants' exposure to the terrorist attacks and the psychosocial impact of the attacks and 5 questions about shifts in personal and professional focus resulting from disaster exposure (Eidelson et al., 2003). Respondents also provided free responses to questions about the nature of their response work. To this end, they reported engaging in many activities outside the realm of individual therapy, including psychoeducation within the community; support to other volunteers, coworkers, and schools; public speaking; and support to friends and family (Eidelson et al., 2003). Participants reported changes in both their professional and personal lives. According to Eidelson et al. (2003), 57% of participants reported an increase in work related stress, 50% reported that they sometimes felt professionally unprepared, 62% indicated change in their professional

focus, 57% reported increased demands on their professional time, and 39% reported that their idea of what constitutes an irrational fear had changed to some degree in response to the attacks. Eighty-two percent of participants reported that their personal lives had been affected and 72% reported feeling more fearful since the attacks (Eidelson et al., 2003). Although Eidelson et al. (2003) did not assess for PTSD specifically, their finding that a majority of psychologists surveyed reported increased fear and stress and changes in professional and personal functioning raises questions about whether some of these consequences may be related to posttraumatic symptoms. Interestingly, Eidelson et al. (2003) reported a significant difference between the number of surveyed psychologists who reported an increase in positive (54%) versus negative (11%) feelings about their work ( $t(600) = 16.11, p < .01$ ). This finding coincides with accounts from MHDRs that disaster response work can be quite rewarding (V. Arnold, personal communication, September 10, 2012; K. Burns, personal communication, May 30, 2013; Rogers, 2007; Spokane et al., 2011; Tosone, 2011). Another interesting aspect of this study is the fact that the psychologists surveyed also worked in close proximity to the attacks (the authors do not indicate whether they also lived in the same vicinity).

Eidelson et al. (2003) acknowledged limitations to their research including the narrow focus on one type of MHDR (psychologists) in a very specific area. The absence of an empirically validated measure of PTSD also prohibits conclusions about rates of disaster-related traumatic stress. Yet Eidelson et al. (2003) must be credited with one of the only empirical contributions to the burgeoning area of MHDR research. Their findings confirm that there is disruption in emotion and functioning among MHDRs



following a disaster and provide support for further investigation of specific mental health symptoms in this population.

### **Secondary Traumatic Stress (STS)**

No researchers to date have reported on the prevalence or severity of PTSD among MHDRs specifically. Some researchers, however, have found evidence for STS in this population (Creamer & Liddle, 2005; Pulido, 2012). STS is “a set of psychological symptoms that mimic post-traumatic stress disorder, but is acquired through exposure to persons suffering the effects of trauma” (Baird & Kracen, 2006, p. 181). STS can result from any interactions with traumatized individuals, but is particularly prevalent among helping professionals who work closely and often over extended periods of time with these individuals (Declercq & Willemson, 2006). Helping professionals who work with trauma provide support and facilitate posttraumatic coping – roles that require extensive exposure to a client’s trauma experience. These roles make them particularly vulnerable to STS. Professionals who intervene following a disaster, then, may be dually traumatized by exposure to aspects of the disaster event as well as STS from their work with disaster survivors (Bilal et al. 2007; Tosone, 2011). Baum (2011) termed this a “shared traumatic reality” (p. 37); and it is a reality that makes the experience of serving as a MHDR qualitatively different from other professional disaster responders and disaster survivors.

Researchers who study the psychological impact of disaster response work on professional responders have observed PTSD-like symptoms as a result of STS or VT. Often, STS and VT are confused in the literature, although STS is typically distinguished

as the set of symptoms, virtually identical to those of PTSD, that result from indirect trauma exposure (VT is more closely associated with related shifts in worldview) (Baird & Kracen, 2006). Numerous researchers have investigated STS/VT among mental health professionals working with disaster survivors (e.g., Palm et al., 2004; Rogers, 2007) and non-disaster-related trauma (Buchanan et al., 2006; Baird & Kracen, 2006; Moulden & Firestone, 2007; Sommer, 2009; Devilly et al., 2009). Many focus on potential predictors of STS, including past trauma history (Buchanan et al., 2006), amount (duration) of exposure to clients' traumatic material (Baird & Kracen, 2006), professional experience (participants were more susceptible to symptoms of VT early and late in their careers; Moulden & Firestone, 2007), treatment setting (secure and prison settings were related to higher levels of VT; Moulden & Firestone, 2007), and use of both positive and negative coping strategies (Moulden & Firestone, 2007). The finding that some positive coping strategies may predict VT is somewhat counter-intuitive. Moulden and Firestone (2007) concluded that this finding may be due to negative coping strategies (i.e., avoidant coping) that actually overpower positive strategies and lead to negative outcomes even when adaptive coping skills are available. Where MHDRs are concerned, this may mean that certain styles of coping (e.g., avoidant) can be particularly detrimental, even in the presence of other positive coping strategies.

Because symptoms of STS are so closely aligned with symptoms of PTSD, it is nearly impossible to empirically separate the two, especially within the same study. As a result, STS is often assessed in the same way as PTSD. One of the most commonly used PTSD assessments, the IES-R, has been employed repeatedly to measure STS/VT (e.g.,

Bober & Regehr, 2006; Buchanan et al., 2006). For example, Steed and Bicknell (2001) used the IES-R to survey therapists working with perpetrators of sexual abuse and found mild disruptions in intrusive (15.4%), avoidant (12.5%), and hyperarousal (8%) symptoms. These rates are similar to rates of PTSD observed in professional disaster responders, which may indicate that STS is integral to the symptom profile being assessed in that population.

Beaton, Murphy, Johnson, and Nemuth (2004) surveyed 261 urban firefighters living and working in the Pacific Northwest United States within the month following the 9/11 terrorist attacks for symptoms of STS using the IES, the predecessor to the IES-R. Due to shift changes, different firefighters took the assessment at different points during the month (Beaton et al., 2004). Analysis of variance yielded significant differences between firefighters' IES avoidance and intrusiveness scores on the day before the attacks, 1-2 days following the attacks, and 1 month following the attacks ( $p < .05$  for all post hoc Tukey comparisons) (Beaton et al., 2004). Avoidance was lower on September 10, 2001 (mean IES score of 2.9) than on September 12 and 13 (5.3) and 1 month later (5.8) (Beaton et al., 2004). Intrusiveness followed a different pattern, with the lowest scores on September 10 (4.5), a rise in symptoms on September 12 and 13 (7.5), and some regression in scores measured 1 month later (6.7) (Beaton et al., 2004). The original IES does not assess for hyperarousal symptoms (Horowitz et al., 1979). In general, these mean IES scores were quite low and did not meet the established cutoff score of 26 that the researchers used to assess for clinical indicators of PTSD. Beaton et al.'s (2004) results are notable, however, because they provide evidence of PTSD symptoms among a

sample of professional responders who were not directly exposed to the events of 9/11, suggesting STS within an indirectly exposed population. One can assume that the firefighters in Beaton et al.'s (2004) sample were not exposed to others' traumatic experiences to the same degree as a mental health professional working directly with victims of the disaster might be. This may provide some explanation for the relatively low IES scores.

Creamer and Liddle (2005) and Pulido (2012) both conducted empirical studies of MHDRs who responded following 9/11, constituting the only other known empirical work focused directly on the psychological implications of disaster response for MHDRs. Creamer and Liddle (2005) surveyed 80 disaster mental health workers who responded to the 9/11 terrorist attacks for STS symptoms (as measured by the original IES), personal trauma history, and other factors known from previous studies to relate to STS. Participants who were within a 15-mile radius of the attacks or had a friend or family member in close proximity to the attacks were excluded (Creamer & Liddle, 2005). Participants completed the survey between 3 and 5 months following the disaster (Creamer & Liddle, 2005). Creamer and Liddle (2005) reported significant correlations between STS symptoms (IES scores) and number of hours working with trauma survivors in the previous 6 months ( $r = 0.33, p < .05$ ) and over the course of participants' career ( $r = 0.32, p < .05$ ). This finding indicated that the impact of disaster response and trauma work in general may be cumulative for some MHDRs, and that responding to multiple disaster events could escalate risk. This is consistent with research that survivors who are exposed to multiple disasters are more at risk for PTSD. Other significant predictors of

STS included number of days on assignment ( $r = 0.27, p < .05$ ), percentage of time spent with clients who discussed morbid material ( $r = 0.29, p < .05$ ) and sensory-related memories ( $r = 0.31, p < .05$ ), and time spent with children ( $r = 0.28, p < .05$ ) or firefighters ( $t(78) = 2.23, \eta^2 = 0.06, p < .05$ ) (Creamer & Liddle, 2005). Creamer and Liddle (2005) reported that many of the potential predictors of STS they assessed were not significant predictors, including years since first MHDR training, MHDR gender, relationship status, education level (master's versus doctorate), years in mental health field, years working with trauma survivors, and profession (psychologist, social worker, counselor) (Creamer & Liddle, 2005). Many of these predictors also will be tested in the current study to rule out moderating effects. The findings reported by Creamer and Liddle (2005) are expected to hold true. Although Creamer and Liddle (2005) used the IES, a measure based directly on symptoms of PTSD, to assess for STS, they did not report descriptive statistics for MHDRs' IES scores. It is unknown, therefore, how the prevalence and severity of trauma symptoms among their sample compared to those of non-mental health disaster responders and other trauma-exposed groups.

Pulido (2012) conducted the only qualitative study to date of MHDRs' mental health. She interviewed 26 mental health clinicians who were indirectly exposed to the 9/11 terrorist attacks and who engaged in therapeutic work with disaster-exposed individuals (Pulido, 2012). Interviews took place roughly 3 years following the attacks and participants were asked specifically about their experiences with disaster-related STS (Pulido, 2012). Pulido (2012) reported that STS levels remained high 30 months after the attack; that many clinicians lacked experience providing disaster-related mental health

care (which can be quite different from routine mental health care [Spokane et al., 2011]); and that access to supervision and agency support was weak, although peer support was helpful.

### **Factors That May Contribute to PTSD Among MHDRs**

Because their roles in disaster differ markedly from those of disaster survivors, some of the aforementioned factors that can influence disaster-related traumatic stress may affect MHDRs differently. Researchers have yet to report on the prevalence and severity of PTSD among MHDRs, so nothing is known specifically about predictors of PTSD among this group. As detailed above, a few researchers have studied predictors of STS among MHDRs, with emphasis on individual characteristics, previous trauma, and past exposure to STS through work experience. In the current study, PTSD will be used as a cumulative indicator of direct trauma and STS, as symptoms of each are known to overlap and precedent exists to assess both using the same instrument (the IES-R). In the following section, the factors known to contribute to disaster-related trauma among survivors will be revisited and discussed briefly as they pertain to MHDRs.

**The disaster agent.** There is no literature to suggest any differences in PTSD symptom severity among professional disaster responders based on the type of disasters to which they respond. As is true with many of these factors, the fact that MHDRs often arrive on the scene days or weeks after a disaster occurs likely reduces any influence of disaster type unless a MHDR is also a resident of the affected community. Even if a responder does not experience the disaster directly, the scope, scale, and duration of the disaster may impact her or his psychological response, as disasters with greater severity

(i.e., damage, death, and injury), greater range, and longer duration may expose MHDRs to additional stressors once they arrive on-site.

**Preexisting characteristics of the affected population.** Like survivors, MHDRs may have experienced traumatic events prior to the disaster. Specifically, previous disaster responses may put them at higher risk for PTSD or exacerbate past symptoms.

**Characteristics of the affected communities.** The significance of these factors for MHDRs depends heavily on whether a MHDR is also a member of the affected community. If so, he or she would be susceptible to the same risk factors as any other resident of that community. If not, it is unlikely that the characteristics of the affected community (the way the community responds and interacts) would weigh much on her or his psychological response to the event. Social support from colleagues and the community may help protect against impairment.

Following the April 24, 2013 collapse of the Rana Plaza building that housed a garment factory in Savar, Dhaka, Bangladesh, professional disaster responders and lay responders both descended upon the wreckage of the destroyed building to engage in the search and rescue operation (Hossain, 2013). While lay responders were viewed as heroes, professional responders were criticized and ridiculed for following protocols that, from the perception of onlookers, delayed the rescue efforts (Hossain, 2013). Situations such as the one in Bangladesh are not unusual following disaster. Community members may view professional responders as privileged outsiders (Spokane et al., 2011). Lacking support from the community they are trying to help, many MHDRs may be disheartened by this dynamic and the loss of support could fuel symptoms of emotional impairment.

**Negative life events occurring after the disaster.** For MHDRs who are not members of the disaster-affected community, there will likely be fewer losses, fewer stressors, and less upheaval than that which is experienced by survivors. Therefore, negative life events resulting from the disaster would be less of a consideration for these individuals. Some MHDRs, however, have reported life stressors related to their decision to respond to a disaster, including relationship strain, financial difficulties, and the stress of time spent away from home (V. Arnold, personal communication, September 10, 2012). Additional stressors such as these may indeed impact long-term symptoms of PTSD.

**Personal coping strategies.** As the only trauma-related factor that can be readily influenced, personal coping strategies are paramount for MHDRs. Poor coping strategies may result in higher risk of PTSD whereas positive and proactive strategies may reduce that risk. Of particular concern is a MHDR's adult attachment security because attachment patterns may dictate how that individual seeks support from others and uses internal coping mechanisms to effectively process negative thoughts and emotions. Accordingly, avoidant coping strategies and avoidant emotion-focused coping have both been associated with higher rates of distress among survivors; and it is likely that the same would be true for responders. In order to avoid this pitfall, coping strategies grounded in mindfulness and effective emotional processing (ER skills) may be particularly useful in reducing risk of PTSD among MHDRs. Such skills could be incorporated into training and preparation programs. Programs could also work with



MHDRs-in-training to build awareness of their attachment styles, established coping mechanisms, and how these might help or hinder their work in the field.

**Individual factors.** Although gender is a significant predictor of PTSD severity among disaster survivors, researchers who study responders have not found any gender effects among MHDRs or other professional disaster responders. As discussed previously, past personal trauma and exposure to client trauma may increase the risk of PTSD among MHDRs. Little is known, however, about whether past mental health symptoms, a known risk factor for impairment among survivors, is also a factor in predicting PTSD among responders. In the current study, participants will be asked to indicate on a demographic questionnaire whether they have any previous history of mental health diagnosis.

Some personality characteristics (neuroticism, trait worry, trait anxiety) and elements of worldview and outlook may affect PTSD symptom development among MHDRs. These factors, however, can be complicated to assess and were not included in the current study.

Two of the most robust predictors of PTSD severity among survivors – injury to self and others and threats to life – contribute to the severity of disaster exposure and may strongly predict severity in MHDRs as well. Although possible, it is less likely that MHDRs will be exposed to injury or the threat of death than other first responders who are tasked with rescue and recovery. Creamer and Liddle (2005) did not find any effects for professional affiliation and level of education (master's versus doctorate), although

they are the only known researchers to assess these factors and further support is needed for their findings.

**Work-related factors.** The addition of two factors is necessary when discussing MHDRs – work-related factors and proximity. Aspects of previous work (e.g., trauma work with clients, previous disaster responses) and occupational background (i.e., professional orientation and years of experience) may influence PTSD symptom severity among responders. Past trauma work is known to predict STS among mental health professionals and repeated disaster exposure also is known to exacerbate PTSD symptoms.

**Proximity.** Because MHDRs often are deployed from other areas of the country or even the world, their relative proximity to a disaster when it occurs may profoundly impact their mental and emotional response. For instance, a psychologist in Eidelson et al.'s (2003) study who lived and worked very near the site of the 9/11 terrorist attacks would have been exposed to a multitude of stressors, negative life events, potential losses, and higher threat of injury or death – far more so than a MHDR who traveled from another location, as in Creamer and Liddle's (2005) study.

Related to proximity, fear for a loved one also affected by the disaster has been associated with higher rates of STS among professional disaster responders (Wee & Myers, 2002). Responders have reported preoccupation with finding and securing family members and loved ones located nearby in the immediate aftermath of a disaster and have noted that this preoccupation often interfered with their ability to work effectively (Fair, 2011).

### **Impact of MHDR Impairment**

Although no evidence has been reported to verify rates of PTSD among MHDRs, review of data from other professional disaster responders suggests that MHDRs are likely to experience some PTSD symptoms from direct trauma exposure, STS, or both. A primary rationale for the current study is the potential threat to the mental health and wellbeing of disaster survivors being treated by impaired professionals. The intrusion, avoidance, and hyperarousal triad of PTSD predicts that MHDRs who experience even mild posttraumatic symptoms may become preoccupied with seeking safety, overwhelmed by strong thoughts and emotions, and detached from their internal experiences and from their work. In the context of the role requirements of MHDRs, these outcomes could be extremely detrimental to the responders' wellbeing, as well as that of the survivors they are meant to support.

Emotion, a primary component of intellectual activities such as reasoning, learning, planning, and perception (Chakraborty & Konar, 2009), is central to the development of PTSD. According to the avoidance model of PTSD, symptoms develop because an individual is unable to process overwhelming thoughts and feelings and must therefore distance her- or himself from those experiences in order to avoid flooding (Thompson et al., 2011). If emotion is essential to many of the intellectual activities required by MHDRs, then it follows that avoidance of emotion might lead to cognitive impairment. Other researchers suggest that awareness of one's own emotions and internal states may also be instrumental to interpretation and understanding of others' emotions – undoubtedly a vital function of MHDRs (Neumann, Van Lier, Gratz, & Koot, 2010).

Providing further evidence for the primacy of emotions in MHDR work, Diamond and Aspinwall (2003) pointed out that the neural circuits associated with emotional experience and regulation are integrated in the prefrontal cortex of the brain along with neural circuits responsible for the regulation of bodily states, social perception and cognition, interpersonal communication, and memory. Extreme disruptions to one's emotional experience and impairment in emotion regulation, as would occur in the development of PTSD, might therefore affect anything from the functioning of the autonomic nervous system to one's ability to communicate clearly.

Considering the avoidance model of PTSD and research in the areas of ER and emotional intelligence, the primacy of emotions for MHDRs is clear. It is no wonder that attrition rates among MHDRs tend to be high (V. Arnold, personal communication, September 10, 2012) and impairment and burnout may impact the clients of affected MHDRs, even outside of disaster response work. Failure to effectively regulate emotions and persistent use of maladaptive coping skills may lead not only to psychological problems for MHDRs, but also grave implications for those they treat.

### **Current Trends in Training Professional Disaster Responders**

Currently, ARC and other major disaster response organizations provide disaster training seminars and/or online courses that are required by all disaster response personnel and volunteers prior to their first response (ARC, 2012). In 1990, ARC commissioned a task force to investigate the mental health needs of disaster victims and responders with an eye toward developing organized training and educational programs to meet those needs (Morgan, 1995). Based on recommendations from that task force,

ARC founded their DMH program and developed a training course for preparing mental health professionals to adapt their skills to a disaster setting (Morgan, 1995). Morgan (1995) noted that the ARC training courses for mental health professionals are generally not skills-based, but are focused primarily on providing information about the post-disaster environment and how it differs from a more traditional mental health practice setting. Researchers in recent years have called for further attention to be paid to coping and resilience factors among MHDRs and other professional disaster responders (Jacobs, Hoffman, Leach, & Gerstein, 2011; Juntunen, 2011) and for the incorporation of prevention and self-care strategies into MHDR training programs (Jacobs et al., 2011; Whealin, Ruzek, & Southwick, 2008). Professional disaster responders have noted many benefits to doing response work, including increased social awareness and a sense of contribution to the community (Dass-Brailsford, Thomley, & Hurtado de Mendoza, 2011; Freedman, 2004; Wyche et al., 2011). With proper preparation and effective coping, such benefits could be maximized while minimizing the impairment that contributes to attrition and burnout among MHDRs.

### **Adult Attachment Theory**

Attachment theory (AT) is a theory of social development (Ravitz et al., 2010) created by John Bowlby (1958, 1969/1982, 1973, 1980) and based on Bowlby's belief that a child's first relationships with caregivers influence her or his future wellbeing (Karen, 1998). Bowlby and his colleague Mary Ainsworth (Ainsworth & Bell, 1970) built AT around the assumption that people develop secure or insecure attachment styles based upon early interactions with caregivers and that these styles largely determine how

a person will cope with unfamiliar or threatening situations as an adult (Ainsworth & Bowlby, 1991). An individual who is securely attached has grown up in a relational environment that was responsive to her or his needs with caregivers who provided a safe base from which to seek comfort when he or she ventured into threatening or unfamiliar territory (Ainsworth & Bowlby, 1991). As an adult, this individual is likely to be able to appropriately navigate novel or aversive situations by drawing on effective internal and external coping mechanisms (Ainsworth & Bowlby, 1991). An individual who is insecurely attached, on the other hand, grew up in an environment in which caregivers were either unresponsive to her or his needs and dismissive of security-seeking behaviors (avoidant attachment) or were inconsistent in their responsiveness and unreliable as a source of security (ambivalent-resistant attachment; also described as anxious attachment) (Ainsworth & Bell, 1970). Unlike securely attached individuals, those with insecure attachment patterns will likely struggle in novel and aversive situations as adults, lacking either the ability to seek sufficient support from others (avoidant attachment) or to effectively manage difficult emotions within themselves (anxious attachment) (Ainsworth & Bowlby, 1991).

Adult attachment style represents the way in which an adult orients to the world as either safe, secure, and trustworthy or unsafe and threatening, based on that individual's beliefs about self and others (Bartholomew, 1990). The concept of adult attachment style is based in Ainsworth and Bowlby's (1991) security theory, which provides a framework for an individual's transition from childhood attachment patterns to adult attachment patterns. Although, according to Ainsworth and Bowlby (1991), the

latter is very much grounded in the former, the sources of sought security shift from childhood to adulthood. This framework is based on Bowlby's idea of internal working models. He believed that, throughout childhood, individuals develop working beliefs about self and other as either positive (reliable and trustworthy) or negative (unreliable and untrustworthy) based on experience (Ainsworth & Bowlby, 1991). A child's first attachment patterns are based on immature dependent security, a complete reliance on caregivers to meet all basic needs for survival and emotional security (Ainsworth & Bowlby, 1991). Ideally, as the child grows to be an adult, immature dependent security transitions into a more complex form. That is, a healthy well-adapted adult learns to rely on two sources of emotional security: (a) independent security and (b) mature dependent security (Ainsworth & Bowlby, 1991). Independent security is characterized by effective use of internal coping mechanisms to regulate thoughts and emotions and provide self-assurance so that adults are not constantly turning to others to feel safe, as they did when they were children (Ainsworth & Bowlby, 1991). Mature dependent security is characterized by effective use of reciprocal peer relationships as a secure base to aid in coping (Ainsworth & Bowlby, 1991). A securely attached adult will have developed both forms of security-seeking and be able to source both effectively as needed without relying too heavily or inappropriately on one or the other. This state of equilibrium is known as adult attachment security (AAS), a dimension of adult attachment characterized by positive beliefs about self and others, low attachment anxiety, low attachment avoidance, and the ability to adapt to new and aversive situations by effectively drawing

upon both independent security and mature dependent security where appropriate (Bartholomew & Horowitz, 1991).

For insecurely attached adults, this equilibrium is disrupted, rendering individuals unable to adaptively source emotional support externally and/or internally and resulting in heightened attachment anxiety and/or avoidance. Adult attachment anxiety (also known as dependence) is characterized by negative beliefs about self and/or others that can lead to a lack of independent security, an overreliance on others, and inability to cope internally with novel or aversive feelings and situations (Bartholomew & Horowitz, 1991). Adult attachment avoidance is characterized by negative beliefs about self and/or others that can lead to a lack of mature dependent security, distancing from external supports, and an inability to effectively use those supports in order to cope with novel or aversive feelings and situations (Bartholomew & Horowitz, 1991). In the first case, the individual is relying too heavily on external coping mechanisms for a felt sense of security. In the second, he or she is relying too heavily on internal coping mechanisms. Both can become problematic in adulthood and can lead to maladaptive coping styles.

Hazan and Shaver (1987) extended Ainsworth and Bowlby's work, applying it to adult romantic relationships. They were the first to formally suggest that adult attachment patterns might translate to the way people show up in relationships with one another. They developed categorizations of adult attachment styles that built on Ainsworth's childhood attachment styles (i.e., secure, anxious/ambivalent, avoidant), adapting them for an adult relational landscape: (a) secure – comfortable with closeness and trust, lack of jealousy or fear; (b) avoidant – fearful of intimacy, minimal experience with positive



relationships; and (c) anxious-ambivalent – characterized by affect lability, extreme jealousy, obsessiveness, and an overreliance on one's partner for felt security (Stein, Jacobs, Ferguson, Allen, & Fonagy, 1998).

Bartholomew (1990) later adapted Hazan and Shaver's (1987) idea of adult styles of attachment and extended Ainsworth and Bowlby's (1991) concept of internal working models to adults as well. She developed four styles of adult attachment that, unlike Hazan and Shaver's (1987) styles, do not rely on romantic relationships for context but can be based instead on the way adults orient to others in general (Bartholomew, 1990). Her four adult attachment styles were based on internal working models of self and other (positive or negative) as well as Ainsworth's concepts of adult attachment avoidance and anxiety/dependence (Bartholomew, 1990). They include the following: (a) secure attachment – characterized by a positive view of self and other and low avoidance and anxiety; (b) preoccupied attachment – characterized by a negative view of self and a positive view of other with high attachment anxiety and low attachment avoidance; (c) dismissing attachment – characterized by a positive view of self and a negative view of others with low attachment anxiety and high attachment avoidance; and (d) fearful attachment – characterized by a negative view of self and others with high attachment anxiety and avoidance (Bartholomew, 1990). Some attachment scholars argue that Bartholomew's (1990) concept of internal working models diverged too drastically from Bowlby's original conceptualization (Stein et al., 1998). Her model, however, synthesized work by Ainsworth and Bell (1970) and Hazan and Shaver (1987) in a way that was applicable to diverse adult relationships and later fueled the development of

validated measures of adult attachment security, including the Attachment Styles Questionnaire (ASQ) (Feeney et al., 1994).

### **Adult Attachment Theory and Disaster**

In her original strange situation experiments, Mary Ainsworth developed categories of attachment style (i.e., secure, avoidant, anxious-ambivalent) based on infants' behavioral reactions to being in a strange and unfamiliar environment in the absence of a primary caregiver (Ainsworth & Bell, 1970). Disaster can be thought of as an adult version of Ainsworth's strange situation wherein adults are collectively exposed to an unusual, aversive, and threatening situation in which reliable sources of security (i.e., familiar people, places, things, routines) are either absent, damaged, or not functioning in reliable ways. Under such circumstances, Bowlby (1969/1982, 1973, 1980) would predict the emergence of a variety of security-seeking attachment behaviors as core attachment mechanisms are triggered on a visceral level.

Bowlby wrote about three patterns of attachment behaviors he observed in young children who were separated from their caregivers: (a) protest – crying, active searching for the caregiver, and resistance to others' soothing efforts; (b) despair – passivity and obvious sadness; and (c) detachment – active, seemingly defensive disregard for and avoidance of the caregiver upon return (Hazan & Shaver, 1987; Karen, 1998). Ainsworth and Bell (1970) observed many of the same behaviors in the infants they studied. In an interesting coincidence, these three behavior patterns are in many ways analogous to those exhibited by adults with PTSD – protest in the form of hypervigilance and preoccupation with security-seeking; despair as intrusive emotion, including heightened

anxiety and sadness; and detachment as avoidance – emotional numbing, repression, and denial. It seems that the emotional and behavioral reactions an individual has in the face of a threatening or traumatic event such as disaster may reflect the activation of core attachment mechanisms. In this case, early signs of PTSD may actually be adaptive responses to a very real perceived threat – the manifestation of early attachment patterns meant to re-establish felt security in an insecure environment. The persistence of symptoms in the weeks and months following the event, however, may indicate that the traumatized individual is stuck in her or his state of crisis and unable to access or effectively utilize mechanisms of internal and external coping (independent security and mature dependent security). According to this hypothesis, PTSD symptoms (by definition lasting more than 4 weeks post-trauma) (APA, 2013) could be explained as inadequate coping – an explanation consistent with the avoidance model of PTSD symptom development (Orsillo & Batten, 2005; Thompson et al., 2011), adaptive models of traumatic stress (North, 2003), and empirical evidence that avoidant coping styles are related to increased PTSD severity (Moulden & Firestone, 2007).

The collective nature of disaster makes understanding post-disaster trauma a complex and challenging task, in many ways more complex than understanding individual trauma. In the case of disaster, not only has an individual been exposed to potentially threatening situations, extreme emotions, and numerous stressors, but the magnitude of the threat and potential loss makes disaster trauma qualitatively different. Threats to life and personal wellbeing extend beyond one person to an entire neighborhood, community, or even society. Those who live within the affected area

either lose or have potential to lose their residences, their social support, their community organization, and aspects of their neighborhood or community culture that, in the case of an individual trauma, they could otherwise cling to for stability and support. As Erikson (1978) observed in the Buffalo Creek community, these stabilizing forces often are destroyed or seriously impaired following a disaster, cleaving those affected from their secure and familiar environments, extending the period of trauma exposure, and exacerbating their trauma response. As Silverstein (1992) wrote, “The essence of a disaster is the abrupt transition from our mundane, relatively safe lives into an environment of chaos and hell... Whatever the origin of the unexpected event – earthquake, tanker truck collision, air crash, or an armed attack within a favorite restaurant – common, everyday pursuits are replaced instantly by a desperate struggle for escape and survival” (p. 3). Even Tyhurst (1951), one of the earliest disaster researchers concerned with mental health, seems to reference attachment mechanisms in his observations of disaster survivors’ behavior: “There is a definite desire and need to be with others, and to achieve a stable, supporting interpersonal environment” (p. 767). Attachment patterns set the stage for how people will cope with difficult situations as adults; and few situations could be more unusual or fear inducing than disaster.

### **Emotion Regulation (ER)**

ER is “the ability to monitor and modulate emotional reactions, especially in the context of goal-directed behavior” (Lilly & Valdez, 2012, p. 611). It is central to both the development of PTSD (inability to regulate emotions that results in avoidance) and to the role expectations of MHDRs. Emotions are “evolved situation-response tendencies”

(Diamond & Aspinwall, 2003, p. 127) that create a feedback system between an individual and her or his environment. According to Diamond and Aspinwall (2003), emotions consist of multiple components: (a) subjective feeling states, (b) cognition and information processing, (c) expressive displays and behavior, (d) motivation, and (e) physiological responses. In other words, an emotion is the synthesis of a feeling (generated by subjective response to external stimuli) with the resultant cognitions and behaviors that evolve from that feeling. It is motivated by the desire for specific responses from the environment in order to achieve an individual goal.

From a very early age, children experience emotions and learn to rely upon them to communicate with the external world (Diamond & Aspinwall, 2003). Examples of this can be found in AT. An infant placed in a strange situation and left without her or his caregiver will experience emotions in response to the situation. These emotions may be labeled as sad, afraid, angry, or even ambivalent, but they are meant to elicit a specific response from the environment. A sad child may begin to cry, motivated by the need for comfort and reassurance. An ambivalent child will likely continue playing and ignore the caregiver's absence – an indication that the child is accustomed to being abandoned in this way and does not experience her or his caregiver as reassuring so there is no motivation to react. In this way, emotions provide humans with a way of communicating our needs even before we are able to speak. Thus, appropriate regulation of emotions is essential to accurate communication and perceived effectiveness within one's environment.

ER is akin to emotional intelligence (EI), defined as one's ability to perceive and accurately express her or his own emotions and to recognize and accurately interpret the emotions of others (Mayer & Salovey, 1997). The difference lies in ER's emphasis on the use of emotional material to achieve a specific goal (Lilly & Valdez, 2012). Gratz and Roemer (2004) designed the DERS based on four dimensions of ER: (a) awareness and understanding of emotions, (b) acceptance of emotions, (c) ability to control impulsive behaviors and to behave in accordance with desired goals when experiencing negative emotions and situational demands, and (d) ability to use situationally appropriate strategies in a flexible way to modulate emotional responses in order to meet individual goals and situational demands.

Based on Gratz and Roemer's (2004) dimensions of ER, it is easy to see why ER would be important to MHDRs during disaster response. Their work requires them to be closely attuned with both internal and external states and to manage input from each in order to inform appropriate action and meet situational demands. Without the ability to regulate emotions effectively, MHDRs may lose awareness of their own emotional states, avoid experiencing difficult emotions, become so absorbed in negative emotions that they act impulsively, or become rigid in their responses and behavior. In short, they may lose the ability to effectively interact and communicate with their environment (Diamond & Aspinwall, 2003). All of these outcomes have the potential to thwart response efforts and all are consistent with the symptom profile for PTSD (APA, 2013).

Unlike external sources of coping, ER remains under the control of the individual and can be relied upon as an internal coping strategy in situations where external supports

may be absent. This is often the case for MHDRs working in the field. Although professional disaster responders often work in teams, team members are not always available to provide support when it is most needed. Additionally, Diamond and Aspinwall (2003) point out that ER is not a fixed developmental achievement but a fluid construct that can be improved with skills training and influenced by changing goals and contexts throughout life.

### **ER as a Predictor of PTSD**

The connection between difficulties in ER and PTSD symptom development is widely acknowledged in the trauma literature. Consistent with the avoidance model of PTSD, it seems that thought suppression, emotion suppression, and avoidant coping in particular predict PTSD severity among trauma-exposed groups (Amstadter & Vernon, 2008; North, Spitznagel, & Smith, 2001).

Ehring and Quack (2010) explored the relationship between ER difficulties and PTSD severity among a sample of 616 trauma survivors. They used the DERS, the ERQ (Emotion Regulation Questionnaire), and the AAQ (Acceptance and Action Questionnaire) to measure ER and the IES-R to measure PTSD symptoms. They were also looking specifically for differences in ER difficulties based on early- or late-onset trauma (Ehring & Quack, 2010). A Pearson product-moment correlation revealed a significant relationship between IES-R scores and scores on all indices of ER difficulties, indicating that ER difficulties were associated with higher PTSD severity ( $r = -0.23 - 0.52, p < .01$ ) (Ehring & Quack, 2010). Multivariate analysis of variance (MANOVA) revealed that survivors of early-onset chronic interpersonal trauma reported higher ER

difficulties than all other trauma groups ( $p < .001$ ) (Ehring & Quack, 2010). Ehring and Quack (2010) then ran analyses for main effects while controlling for PTSD in order to determine whether ER difficulties were driving PTSD severity or the other way around. They found that main effects of trauma type held for all indices of ER difficulties except for acceptance of negative emotions and effective use of ER strategies when controlling for PTSD (Ehring & Quack, 2010).

Lilly and Valdez (2012) conducted a correlational study of 248 American undergraduate students who reported experiencing at least one traumatic life event. Their aim was to explore ER and alexithymia as predictors of somatization and PTSD (Lilly & Valdez, 2012). They assessed ER using the DERS and PTSD using the Posttraumatic Stress Diagnostic Scale (PDS) and found that participants who scored high on both somatization and PTSD severity reported greater difficulties in ER ( $F(3, 244) = 10.08, p < .01$ ) and more problems with alexithymia ( $F(3, 244) = 17.87, p < .001$ ), a somatization symptom commonly associated with trauma (Lilly & Valdez, 2012).

In one of the only investigations of ER and PTSD in a specific disaster-affected population and a rare longitudinal disaster study with pre-disaster comparative assessment, Bardeen, Kumpula, and Orcutt (2013) surveyed 691 female undergraduate students for ER difficulties (using the DERS) and symptoms of posttraumatic stress (using the Traumatic Life Events Questionnaire [TLEQ] and the Distressing Events Questionnaire [DEQ]) before, in the immediate aftermath, and approximately 8 months following a mass shooting on their college campus. Using structural equation modeling, they found that ER difficulties assessed during the 2 years prior to the shooting



significantly predicted PTSD symptoms immediately following the shooting ( $\beta = 0.13, p < .01$ ) and that, likewise, more severe symptoms of PTSD pre-shooting predicted higher rates of difficulties with ER immediately following the shooting ( $\beta = 0.09, p < .05$ ) (Bardeen et al., 2013). Difficulties with ER assessed immediately following the shooting also predicted higher rates of PTSD symptoms approximately 8 months following the shooting ( $\beta = 0.17, p < .01$ ) (Bardeen et al., 2013). Bardeen et al. (2013) noted that greater physical exposure to the shooting predicted PTSD severity immediately following the shooting ( $\beta = 0.32, p < .01$ ) and that the amount of time that passed between the shooting and the first post-shooting assessment, which varied from 17-100 days post-shooting, also predicted PTSD severity such that a shorter shooting-to-assessment time interval was related to higher symptom severity ( $\beta = -0.13, p < .01$ ). Bardeen et al. (2013) acknowledge some important limitations, including the fact that their entire sample was female (due to the original intent of the study, prior to the shooting, to examine trauma and sexual revictimization) and that the pre-shooting assessment (up to 2 years pre-shooting) and the first post-shooting assessment (17-100 days post-shooting) both extended over lengthy intervals of time. Their findings do, however, extend evidence for a relationship between ER difficulties and PTSD symptoms to a disaster-affected population and provide longitudinal support for this relationship.

Researchers in the related area of EI have also found evidence for strong empirical connections between emotional awareness and modulation and PTSD. Wagner and Martin (2012) found that EI negatively predicted traumatic stress among a sample of firefighters. Kwako, Szanton, Saligan, and Gill (2011) found that participants who

experienced trauma and depression had lower EI than those who did not. This finding was particularly strong for strategic EI, a subset of EI that involves one's ability to acknowledge emotions and to manage them in a way that promotes personal understanding (Kwako et al., 2011). It follows that those who experience more severe symptoms of traumatic stress also have lower EI aptitude, particularly when it comes to understanding emotions. Although EI and ER are not the same construct, they are quite similar and both involve accurate perception, identification, and understanding of emotions.

Theoretically and empirically, strong connections exist between ER and the development of PTSD symptoms. Although ER has not specifically been studied in populations of MHDRs, existing evidence suggests that it is pivotal to effective identification and modulation of the strong negative emotions that often precipitate PTSD and to the cognitive and behavioral correlates of those emotions. MHDRs who are high in ER difficulties may be more susceptible to developing PTSD symptoms and more likely to struggle with being emotionally present for disaster survivors and with making the kind of spontaneous, flexible, and well-informed decisions that are required of all professional disaster responders.

### **Adult Attachment Security (AAS)**

Attachment security is a condition for healthy relational development that is based on an individual's view of her or his environment as safe, trustworthy, and reliable (Bowlby, 1958). In adulthood, AAS becomes more complex and depends upon effective and reliable coping from internal and external sources alike (Hazan & Shaver, 1987).

AAS is characterized by positive beliefs about self and others, low attachment anxiety, low attachment avoidance, and the ability to adapt to new and aversive situations by effectively drawing upon both independent security and mature dependent security where appropriate (Bartholomew & Horowitz, 1991). In 1997, Mickelson, Kessler, and Shaver reported that 59% of adults in a large nationally representative American sample were assessed as securely attached, compared with 25% avoidant and 11% anxious.

### **AAS as a Predictor of PTSD**

Researchers have identified AAS as a protective factor in predicting PTSD symptom severity (Declercq & Willemson, 2006; Roche, Runtz, & Hunter, 1999; Sroufe, 2005). It seems that one's early relational patterns not only predict adult relational security and aspects of effective coping (Ainsworth & Bowlby, 1991) but may also lower one's susceptibility to long-term psychological distress. In a 30-year qualitative longitudinal study of attachment from birth to adulthood, Sroufe (2005) concluded that secure attachment patterns throughout the lifespan were related to self-reliance, the capacity for ER, and social competence – all necessary to effective disaster response work. Further, Sroufe (2005) noted that patterns of anxious attachment in infancy were a potential risk factor for psychological problems in later life, although they do not necessarily predict them. That is to say that insecurely attached infants, particularly those with high attachment anxiety, will not necessarily develop mental or emotional problems as adults, although they do seem to be at a higher risk for such problems. Accordingly, Sroufe (2005) referred to secure attachment as promotive of healthy adult functioning.

Declercq and Willemson (2006) lent quantitative support to Sroufe's (2005) conclusions with their survey study of 544 high-risk professionals (adults working for a security company and for the Belgian Red Cross). They employed Bartholomew's (1990) adult attachment framework and measured adult attachment style using the Relationship Questionnaire (RQ) (Declercq & Willemson, 2006). They analyzed the relationships between adult attachment style and PTSD symptom severity (measured using the DTS), hypothesizing that adult attachment style and AAS would moderate the development of PTSD symptoms among high-risk professionals following exposure to a traumatic stressor (Declercq & Willemson, 2006). Declercq and Willemson (2006) analyzed their data using Spearman correlations and logistic regression and found that PTSD symptoms were negatively related to secure adult attachment style ( $r = -0.096, p < .05$ ) and positively related to fearful-avoidant ( $r = 0.251, p < .01$ ) and preoccupied ( $r = 0.183, p < .01$ ) attachment styles, as well as an overall measure of attachment anxiety ( $r = 0.248; p < .01$ ). These findings support Sroufe's (2005) observation that attachment anxiety, in particular, seems to heighten one's risk of developing psychological distress and impairment in adulthood. Considered in the context of Attachment Theory, it follows that AAS may help protect high-risk professionals from direct and secondary trauma and that difficulty with internal coping skills (high attachment anxiety) may render them particularly vulnerable. It should be noted that Declercq and Willemson (2006) did not report the amount of time between their assessment and any potentially traumatizing events that their participants may have faced – an important factor in the severity of PTSD symptoms. Despite this methodological concern, these findings have important

implications for MHDRs and the ways in which their attachment patterns may influence their vulnerability to trauma.

In an important contribution to disaster literature, Fraley et al. (2006) provided one of the first empirical studies linking attachment style to disaster-related PTSD among survivors of the 9/11 terrorist attacks. They surveyed 45 adult survivors of the attacks who were within several blocks of the World Trade Center when the attacks occurred. They assessed adult attachment anxiety and avoidance (counter-indicators of AAS) using the Relationship Scales Questionnaire (RSQ; based on Bartholomew's [1991] adult attachment framework); PTSD symptoms using the PTSD Symptom Scale, Self-Report version (PSS-SR); as well as symptoms of major depression 7 and 19 months after the 9/11 attacks (Fraley et al., 2006). Additionally, they asked participants' friends and relatives to provide ratings of the participants' overall adjustment since the attacks (Fraley et al., 2006). Regression analyses did not yield any significant results based on the standard  $p < .05$  significance level, although the interaction of attachment avoidance and attachment anxiety predicted PTSD severity at a  $p = .09$  significance level ( $\beta = -0.26$ ) – the most robust finding among the relationships analyzed (it should be noted that Fraley et al. [2006] considered  $p < .10$  as their cutoff for significance due to a low sample size) (Fraley et al., 2006). Upon closer investigation of the different attachment styles (i.e., Secure, Fearful, Dismissing, and Preoccupied), Fraley et al. (2006) found that those with secure attachment styles fared notably better than any of the participants with insecure attachments styles (Fraley et al. [2006] did not report mean scores on the PSS-SR for each attachment style). While PTSD severity for all attachment groups declined

from 7 to 19 months post-disaster, the decline was slightly more dramatic for the Dismissing group than for the Preoccupied group – which showed nearly identical severity rates at 7 months (Fraley et al., 2006). Although a far reach, especially considering the lack of reported group means and effect sizes, this finding may bolster Sroufe's (2005) and Declercq and Willemson's (2006) contention that attachment anxiety is more influential in long-term patterns of PTSD symptom development than is attachment avoidance. That is, Dismissing individuals (those who score high on attachment avoidance and low on attachment anxiety) fared slightly better in the long run than Preoccupied individuals (those who scored low on attachment avoidance and high on attachment anxiety). Regressions of attachment anxiety and attachment avoidance on collaterals' ratings of participant adjustment did not yield significant main effects (Fraley et al., 2006).

Despite the significant challenge of a small sample size and the subsequent lack of significant main effect findings, Fraley et al.'s (2006) study has important implications. First, it calls attention to adult attachment as a potential predictor of coping and adjustment in a disaster-exposed population, taking a step beyond previous studies that have only examined coping and not its underlying mechanisms. Second, results suggest a possible link between AAS and PTSD severity following a disaster (as evidenced by the readily observed difference in PTSD scores between secure and insecure attachment styles).

### **AAS as a Predictor of ER**

According to Mikulincer et al. (2003), affect regulation strategies develop through the attachment system and become organized around one's beliefs about self and the availability and responsiveness of attachment figures. They contend that "Attachment-figure availability is one of the major sources of variation in strategies of affect regulation" (Mikulincer et al., 2003, p. 79) and note that maladaptive affect regulation strategies result from negative beliefs about self and others. With these assertions, Mikulincer et al. (2003) highlight a seemingly obvious relationship between AAS and ER – that adaptive emotion regulation skills are the logical byproduct of healthy and reliable attachment relationships. In other words, individuals who learn early in life that they can depend on important caregivers for security will become adults who are more likely to use internal and external coping mechanisms, including ER, effectively.

Mikulincer et al. (2003) make a compelling theoretical argument for this connection – a connection that has been well founded in empirical research among children (Esbjörn, Bender, Reinholdt-Dunne, Munck, & Ollendick, 2012; Smith, Calkins, & Keane, 2009), adolescents (Cooper, Shaver, & Collins, 1998; Pascuzzo, Cyr, & Moss, 2013), and adults (Lilly & Lim, 2013). Among these studies, AAS has been associated with children's willingness to converse about negative emotions (Waters et al., 2010), toddlers' adaptive emotional expression (Smith et al., 2009), adolescent adjustment (Cooper et al., 1998), healthier romantic attachment styles in adolescence (Pascuzzo et al., 2013), and lower incidence of anxiety symptoms (Esbjörn et al., 2012).

Additionally, some researchers have suggested that ER may better account for the negative relationship between AAS and PTSD. Esbjørn et al. (2012) reviewed existing literature on the relationships between attachment, ER, and anxiety among children and theorized that strong ER skills grow naturally out of secure attachment relationships. Likewise, Lilly and Lim (2013) surveyed 404 survivors of intimate partner violence (290 undergraduate students and 119 community members) and found that emotion deregulation (measured using the DERS) significantly predicted PTSD symptom severity (measured using PDS) in both the undergraduate ( $\beta = 0.04$ ;  $p = .00$ ) and the community ( $\beta = 0.05$ ;  $p = .01$ ) samples (Lilly & Lim, 2013). Interestingly, the researchers also assessed adult attachment anxiety and avoidance using the Experiences in Close Relationships Scale – Revised (ECRS-R) and did not find any significant relationships, with one exception – anxious attachment significantly predicted PTSD severity for the community sample ( $\beta = 0.96$ ,  $p = .01$ ). This finding is once again in keeping with those of other researchers who have repeatedly noted that psychological difficulties seem to be more closely associated with anxious than avoidant attachment.

Theoretically and empirically, there is a clear link between AAS and ER throughout the lifespan. Additionally, there is evidence to suggest that ER may actually be a more important factor in predicting PTSD among trauma-exposed populations than AAS. Further study is needed to explore whether ER may, in fact, mediate the relationship between AAS and PTSD and to extend these findings to professional disaster responders, particularly MHDRs for whom emotional awareness and coping are highly relevant.



If it can be shown conclusively that ER difficulties predict PTSD over and above attachment security, the implications for disaster responders would be groundbreaking. Since its creation, Bowlby and other proponents of AT have argued that attachment style and security are relatively static traits that remain remarkably consistent over the course of an individual's life (Ainsworth & Bowlby, 1991; Feeney & Noller, 1996). Although Bowlby himself has noted that attachment may shift depending on life circumstances, particularly impactful or traumatic life events (Feeney & Noller, 1996), it is generally regarded as a persistent characteristic about which one can become more aware, but is unlikely to evoke any significant change. ER, on the other hand, is not a fixed developmental achievement but a “moving target,” (p. 149) as Diamond and Aspinwall (2003) put it. It can be more easily influenced and improved by specific skills training. If ER were found to better account for the relationship between AAS and PTSD, then, those who develop training programs for MHDRs could actively reduce their risk for PTSD by training them in ER skills.

### **Mindfulness**

Mindfulness is an individual's ability to remain aware in the present moment by actively connecting with external and internal experiences, and acknowledging those experiences without judgment (Kabat-Zinn, 1994). Jon Kabat-Zinn, who has written extensively on the underlying concepts of mindfulness, characterizes it as a practice, rather than an innate trait. This practice is based on seven foundations: (a) non-judging, (b) patience, (c) beginner's mind, (d) trust, (e) nonstriving, (f) acceptance, and (g) letting go (Kabat-Zinn, 1990). Non-judging requires one to assume “the stance of an impartial

witness to [one's] own experience" (Kabat-Zinn, 1990, p. 33) - that is, to actively challenge the innate human tendency to attach positive or negative judgments to oneself, one's actions, and those of others. Patience, as Kabat-Zinn (1990) puts it, "is a form of wisdom" (p. 34). It represents one's ability to acknowledge the unfolding of life in its own time and to let go of a need to rush or direct the way in which experiences will occur. Beginner's mind is an attitude toward life's experiences characterized by present-moment existence and an outlook of true openness – as if one were experiencing each and every moment for the very first time (Kabat-Zinn, 1990). Trust, in this case self-trust, represents the ability to confidently rely upon one's own intuition and authority in formulating actions and decisions rather than seeking external guidance from the opinions and experience of others (Kabat-Zinn, 1990). Non-striving represents an attitude of release from goals and agendas (Kabat-Zinn, 1990). Similar to patience, non-striving means letting go of one's expectations for things to turn out a certain way or to reach a specific end. Acceptance "means seeing things as they actually are in the present" (Kabat-Zinn, 1990, p. 38). It is different from approval in that acceptance does not involve any value judgments. Acceptance involves acknowledging that one's thoughts, feelings, actions, and state of being are what they are and that they are an authentic part of reality. Finally, letting go means fostering an attitude of non-attachment – learning to free up the places where one's mind and body can become stuck or preoccupied and to allow thoughts and feelings to flow freely, unencumbered by the human tendency to hold on to certain emotions or to ruminate on specific ideas (Kabat-Zinn, 1990). Baer et al. (2006) consolidated Kabat-Zinn's (1990) foundational principles into five factors based

on a factor analysis of five popular mindfulness assessments. These factors are: (a) observing, (b) describing, (c) acting with awareness, (d) nonjudging of inner experience, and (e) nonreactivity to inner experience (Baer et al., 2006).

Brown and Ryan (2003) describe the practice of mindfulness as one way to achieve “greater clarity in thought and action,” (p. 844) a practice that seems integral to effective disaster response and intervention. Mindfulness has been linked empirically with lower psychological distress (Smith et al., 2011; Thompson et al., 2011; Thompson & Waltz, 2010) and has been known to aid in the performance of job-related tasks specific to MHDRs, including engagement in empathy and cognitive flexibility (Brown & Ryan, 2003; Dekeyser et al., 2008; Smith et al., 2011). It also aligns closely with Gratz and Roemer’s (2004) dimensions of ER and has been associated with higher levels of ER (Berceli & Napoli, 2006; Dekeyser et al., 2008; Smith et al., 2011; Vujanovic et al., 2011), also known to reduce risk of PTSD.

### **Mindfulness as a Predictor of PTSD**

The avoidance model of PTSD predicts that symptoms develop and later worsen because an individual consciously and unconsciously avoids thoughts, feelings, and situations that are reminiscent of the traumatic event (Thompson et al., 2011). As a proactive coping strategy, mindfulness directly combats the avoidance coping that has been linked to higher PTSD severity. Theoretically, it makes sense that an individual who is more adept at Kabat-Zinn’s (1990) seven foundational mindfulness skill sets would be better able to connect with difficult thoughts and feelings in the moment, to accept the

reality of those experiences, and to process what those thoughts and feelings mean for her or him without falling into PTSD's cycle of numbing, intrusion, and hyperarousal.

Empirical evidence bears this out. Higher mindfulness aptitude has been related to self-regulated behavior, positive emotional states, and declines in mood disturbance and stress (Brown & Ryan, 2003) as well as more engagement in empathy, better identification and description of feelings, lower social anxiety, and lower distress (Dekeyser et al., 2008). From a diagnostic perspective, greater mindfulness aptitude also has been linked with reduced symptoms of depression, somatization, alcohol abuse, and PTSD (Owens, Walter, Chard, & Davis, 2012; Smith et al., 2011; Thompson & Waltz, 2010). Specifically, some facets of mindfulness practice may be more closely associated with a decrease in PTSD severity. For example, Thompson and Waltz (2010) concluded that nonjudging of experiences accounted for a unique portion of variance in PTSD avoidance symptoms. Similarly, in a study of 149 veterans in a residential PTSD program, Owens et al. (2012) found that improvement in acting with awareness skills was associated with lower levels of post-treatment PTSD and depression. Similarly, Vujanovic, Youngwirth, Johnson, and Zvolensky (2009) also found that acting with awareness skills were negatively related to posttraumatic re-experiencing symptoms among 239 trauma-exposed adults.

Although connections between mindfulness skills and psychological impairment following a traumatic experience are well-founded, little is known about how these relationships translate in populations of professional disaster responders. In one of few studies of mindfulness among disaster responders, Smith et al. (2011) surveyed 124 urban

firefighters and assessed mindfulness and several indicators of psychological distress, including PTSD. They found that mindfulness was negatively related to PTSD severity ( $\beta = -0.32, p < .01$ ), depressive symptoms ( $\beta = -0.29, p < .01$ ), physical symptoms ( $\beta = -0.31, p < .01$ ), and alcohol problems ( $\beta = -0.24, p < .05$ ) (Smith et al., 2011).

Similarly, Chopko and Schwartz (2009) surveyed police officers to study hypothesized relationships between mindfulness competencies (measured using the Kentucky Inventory of Mindfulness Skills [KIMS]) and posttraumatic growth (PTG). Using Pearson correlations, they found that PTG ratings were significantly related to certain aspects of mindfulness measured by the KIMS, specifically effort toward spiritual growth ( $r = 0.36, p < .001$ ), accepting without judgment ( $r = -0.30, p < .001$ ), observing ( $r = 0.27, p < .001$ ), effort toward personal relationships ( $r = 0.21, p < .001$ ), and describing ( $r = 0.16, p < .05$ ) (Chopko & Schwartz, 2009). A multiple regression analysis showed that only two indicators of mindfulness (as measured by the KIMS) significantly predicted PTG: effort toward spiritual growth ( $F(5, 177) = 10.10, p < .001; R^2 = 0.23; R^2_{\text{adj}} = 0.21; t = 2.34, p < .01$ ) and accepting without judgment ( $t = -3.22; p < .01$ ) (Chopko & Schwartz, 2009). These results are consistent with empirical evidence for mindfulness as a protective factor against PTSD and indicate that accepting without judgment may actually be detrimental to PTG. Considered within the context of other studies that broke down mindfulness into its component parts, it seems that acting with awareness and effort toward spiritual growth may be particularly helpful in guarding against PTSD, whereas accepting without judgment may actually be harmful. One explanation for the discrepancy in these findings may be that acceptance of

overwhelming negative affective states during a traumatic experience could mirror the flooding that occurs with PTSD. It is difficult to operationally delineate between nonjudgmental acknowledgment of reality and emotional inundation. Regardless, further research is clearly needed to investigate the true role of mindfulness in predicting PTSD. Examination of this relationship among MHDRs may be particularly useful, as MHDRs are more likely than other professional disaster responders to have been trained in mindfulness skills.

Researchers have already called for integration of mindfulness skills into treatment and prevention programs (Berceli & Napoli, 2006; Vujanovic et al., 2011). Of particular relevance to the current study, Berceli and Napoli (2006) proposed a mindfulness-based trauma prevention program for social workers and other mental health professionals featuring “self-directed techniques to maintain equanimity in the face of danger and human suffering, thereby reducing the incidence of secondary trauma and posttraumatic stress disorder” (p. 153). Their program teaches mindfulness techniques, including breathing, body scan, and other trauma-releasing exercises, with the goal of improving the resilience of mental health professionals who work with traumatized individuals (Berceli & Napoli, 2006). Although the effectiveness of their program has yet to be empirically assessed, it is evidence-based, its methods and goals are consistent with other trauma-focused treatments that incorporate mindfulness (e.g., ACT, DBT, MBSR), and it may pave the way for mindfulness skills training frameworks in preparing MHDRs for disaster response.

### **Mindfulness as a Predictor of ER**

Examination of Gratz and Roemer's (2004) dimensions of ER reveals notable conceptual similarities between ER and mindfulness and even suggests that mindfulness may be a component of ER. Specifically, the first two dimensions of ER – awareness and understanding of emotions and acceptance of emotions – require the mindfulness skills of non-judging and acceptance. Similarly, the third and fourth dimensions of ER – ability to control impulsive behaviors and act in a goal-oriented way and ability to effectively use ER strategies to modulate emotional responses – require the skills of patience, trust, and letting go. A MHDR responding to a disaster may therefore benefit from the ability to be patient, trusting, and to let go of preoccupying thoughts and emotions that would otherwise get in the way of prompt and thoughtful action – all skills that are closely associated with ER.

Recently, researchers have investigated relationships among mindfulness, attachment, and ER. Goodall, Trejnowska, and Darling (2012) assessed mindfulness using the FFMQ, ER using the DERS, and AAS using the ECRS-R in a sample of 192 adults with no previous mindfulness training. Using exploratory factor analysis, they found some overlap among the three concepts and reported best fit for a 2-factor model of their overarching relationships, with the first factor - termed meta-cognition of emotional states – accounting for 36% of variance and the second – describing/labeling experiences – accounting for 16% of the variance (Goodall et al., 2012). The researchers define the first factor, meta-cognition of emotions, as “the recognition that emotions are fleeting mental phenomena rather than a reflection of reality or a fundamental constituent

of the self” (p. 624). It consists of subscales from the DERS and the FFMQ, suggesting the greatest conceptual overlap between ER and mindfulness. The second factor, describing/labeling experiences, is described as reflecting “conscious awareness of emotional states” (Goodall et al., 2012; p. 624) and consists of some subscales from all three measures – the DERS, FFMQ, and ECRS-R. Thus, there appears to be some conceptual overlap between all three constructs, but more so between ER and mindfulness, based on this particular study.

In a study of 572 undergraduate students, Pepping, Davis, and O’Donovan (2013) found evidence for ER as a full mediator of the relationship between AAS and mindfulness. Using the ECRS-R to assess AAS, the FFMQ to assess mindfulness, and the DERS to assess ER, they determined that any correlation between AAS and mindfulness was better accounted for by ER – a key component of both (Pepping et al., 2013).

Taking both of these studies into consideration in the context of theoretical overlap between mindfulness and ER, it is logical to hypothesize that any palliative effect of mindfulness on PTSD may be better explained by similarities between mindfulness and ER. Specifically, the aspects of mindfulness that help protect against PTSD may actually be components of ER.

### **Summary**

The mental health implications of disaster have been a growing target of scholarly research for the last five decades, garnering a flood of attention since the 9/11 terrorist attacks. Although reactions to disaster-related trauma can vary depending on individual and situational characteristics, the overall pattern of psychological response is remarkably



similar and most commonly represented by symptoms of PTSD. The vast majority of research to date on disaster mental health addresses the needs of disaster survivors, including assessment of PTSD prevalence and common predictors of PTSD severity.

A smaller body of literature has emerged in recent decades out of growing public awareness of the specific mental health needs of professional disaster responders and implications of responder impairment on the quality of services delivered to the public. Like survivors, these individuals are also vulnerable to disaster exposure and trauma but, unlike survivors, they are tasked with performing specific jobs under high-pressure conditions that are inherently disorienting and disarming. MHDRs represent a subset of professional disaster responders caught in a unique shared traumatic reality (Baum, 2011) that exposes them to direct trauma from disaster exposure and indirect trauma (STS) from their work with disaster survivors. Disaster responders experiencing even mild symptoms of posttraumatic stress may become preoccupied, overwhelmed, and detached from their internal experiences and from their work, resulting in threats to the mental health and wellbeing of the disaster survivors that rely on them for support.

Because of the intimate nature of their work, MHDRs may be more susceptible to STS than other professional disaster responders and are exposed to many of the same traumatic stressors that are known to lead to PTSD in survivors and other professional responders. Rates of PTSD among disaster survivors have been estimated between 30-40% and among non-mental health professional disaster responders between 10-20%. Despite similar exposure and unique susceptibility to STS, however, no researchers have assessed symptoms of PTSD (representing direct and secondary trauma) among MHDRs.

Coping strategy, a known predictor of disaster-related stress among disaster survivors, is one of the only predictors that can be trained or learned. Yet most correlational studies of professional disaster responders have only focused on assessing rates of symptom severity. Researchers have, for the most part, avoided studying specific coping strategies and mechanisms that may better explain the development of PTSD among professional disaster responders and, more importantly, inform training programs that could teach useful coping skills in order to reduce PTSD risk.

AT provides a useful framework for understanding coping and how it develops across the lifespan. AAS has been found to predict development of effective coping strategies and to protect against PTSD among trauma-exposed populations. Attachment security, however, is considered a relatively fixed trait and, although awareness of one's attachment patterns may help inform decisions to participate in high-risk work, there is little a person can do to make insecure attachments more secure in a general sense.

ER and mindfulness, two adaptive internal coping skills that have both been theoretically and empirically linked with lower PTSD severity and with AAS, can be trained and developed through specific skill building. In fact, there is considerable evidence to suggest that ER may better account for the predictive relationships between AAS and PTSD and between mindfulness and PTSD. If ER does mediate these relationships, then future training programs designed to prepare MHDRs for disaster response work could incorporate ER skills training into their curricula in an effort to decrease MHDRs' vulnerability to long-term psychological distress and to maximize their resilience and effectiveness in the field.

### **CHAPTER III**

### **METHODOLOGY**

In the previous two chapters, a study was introduced to examine the severity of PTSD symptoms among MHDRs, to explore the roles of ER, AAS, and mindfulness as potential predictors of PTSD symptoms within this population, and to evaluate ER as a potential mediating factor. A rationale for this study was outlined in Chapter I. The literature detailed in Chapter II supported the need for further examination of PTSD symptom development among mental health professionals who respond to disaster and the mechanisms underlying the development of these symptoms. Specifically, a review of the literature in Chapter II yielded evidence for ER, AAS, and mindfulness as predictors of PTSD symptoms, suggesting that further exploration of the ways in which these three constructs relate may shed light on the process of PTSD symptom development following disaster exposure. Chapter III includes a description of the methodology for the current study, the goal of which was to expand on existing research by empirically testing these relationships within a sample of MHDRs. Hypotheses, participants, instrumentation, study procedures, and data analysis are each discussed in detail.

#### **Research Questions and Hypotheses**

Research Question 1: What is the severity of trauma-related symptoms among MHDRs and how does it compare to other trauma-exposed populations?

Hypothesis 1: MHDRs' PTSD scores will not be significantly different from other trauma-exposed populations.

Research Question 2: How do ER, AAS, and mindfulness independently relate to PTSD and to what extent does each of these factors predict PTSD symptoms among MHDRs?

Hypothesis 2a: ER, AAS, and mindfulness, independently, will each significantly predict PTSD scores in a negative direction.

Hypothesis 2b: ER will account for more unique variance in PTSD scores than either AAS or mindfulness when the three factors are examined within the same model.

Research Question 3: What additional factors moderate the relationships between each of the predictor variables - ER, AAS, and mindfulness - and PTSD in a sample of MHDRs?

Hypothesis 3: Total number of disaster responses, previous trauma history, perceived scale of disasters to which a participant previously responded, and proximity of those disasters to the participant's residence will each interact with the predictive relationships between ER and PTSD, between AAS and PTSD, and between mindfulness and PTSD.

Research Question 4: Does ER mediate the relationships between a) AAS and PTSD, and b) mindfulness and PTSD among a representative sample of MHDRs?

Hypothesis 4a: ER will significantly mediate the relationship between AAS and PTSD.

Hypothesis 4b: ER will significantly mediate the relationship between mindfulness and PTSD.

## Participants

The target population for this study included all licensed mental health professionals who have provided professional services in the aftermath of at least one disaster. A sample of eligible MHDRs was recruited using snowball sampling. The recruitment process was initiated using two approaches.

An a priori power analysis was run using G\*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009) in order to determine appropriate sample size. A minimum sample size of 118 was suggested, based on the necessary analysis for research question 2, which requires the largest sample. This estimate was based on a medium effect size of  $f^2 = 0.15$ . A range of effect sizes has been reported in studies of similar factors, including psychological impairment following disaster ( $r = 0.174$  [small]; Rubonis & Bickman, 1991), PTSD among non-mental health first responder groups (meta-analysis reporting effect sizes from  $d = 2.0$  [small] to  $d = 5.35$  [large]; Haugen et al., 2012), and emotion regulation ( $f^2 = 0.25$  [medium to large]; Ehring & Quack, 2010). A medium effect size was used for a priori calculations in the current study due to the lack of consensus on effect size in existing literature.

To be included in the study, participants had to be English-speaking American citizens who held an active license in good standing in their respective mental health fields. Eligible mental health fields included counseling, psychology, psychiatry, social work, and marriage/couples and family therapy. Also, participants had to have responded in a professional capacity to at least one disaster within the past five years. In their meta-analysis of quantitative disaster research, Norris et al. (2002a) reported that the most

pronounced mental health impact from disaster exposure is experienced during the year following exposure. The same authors also noted, however, that the timing of post-disaster assessment of mental health symptoms among survivors has varied greatly – from immediate assessment to seven years post-disaster (Norris et al., 2002a).

Researchers have assessed psychological impairment in first responders and rescue workers anywhere from 2 weeks (Fullerton et al., 2006) to 18 months (Osofsky et al., 2011) post-disaster. Finally, some researchers also have noted increased susceptibility to STS among mental health professionals who are new to trauma work (Buchanan et al., 2006; Creamer & Liddle, 2005). In this study, inclusion of MHDRs who had experienced their most recent disaster response within the preceding five years maintained consistency with previous research while maximizing the potential sampling pool within a relatively small population. This criterion also allowed for follow-up assessment of attrition among beginning MHDRs who may have chosen to stop doing disaster response work as a result of direct or secondary trauma. A broad time frame and interdisciplinary focus were used for the current study in anticipation of difficulty generating a sufficient sample size.

### **Procedures and Instrumentation**

Following approval by the University of North Carolina at Greensboro's Institutional Review Board, direct contact was made via e-mail with mental health professionals known to have served as MHDRs. With their consent, these individuals were provided with information about the study and a link to the study survey. They were

asked to pass along the information and related links to any other individuals who may be eligible for the study.

Study information and links also were posted on social networking groups and listservs related to disaster and mental health. Specifically, the following open groups and listservs were targeted (number of members as of June 10, 2013 is included in parentheses for each): “Disasters and Disaster Mental Health” Facebook group (229 members), “National Emergency Management Resource Center” Facebook group (1,018 members), “Disaster Mental Health Provider Network” LinkedIn group (2,392 members), “Crisis, Emergency, and Disaster Recovery Professionals” LinkedIn group (12,156 members), “Trauma Response Institute Forum” LinkedIn group (290 members), “American Red Cross” LinkedIn group (13,319 members), “Voluntary Organizations Active in Disaster” LinkedIn group (833 members), “Professionals in Emergency Management” LinkedIn group (18,735 members), “Center for Trauma and Counseling, Inc.” LinkedIn group (98 members), “Mental Health Networking” LinkedIn group (18,720 members), and “United States Mental Health Professionals” LinkedIn group (20,355 members). In addition, requests to distribute links to the study survey were sent to the following closed or privately run social network groups and listservs: the “American Red Cross” Facebook page, the “American Red Cross: International Disaster Response Roster” Facebook group (57 members), and the “American Red Cross Volunteers” Facebook group (771 members). The administrators of these groups, however, did not provide permission to distribute the survey. Therefore, they were not used for recruitment. Information about the study also was distributed via CESNET-L, a

national listserv for counselor educators and supervisors. In addition, requests were made to area mental health graduate programs to send study information and links to their alumni listservs. The departments of Counseling and Educational Development and Social Work at The University of North Carolina at Greensboro each provided written permission to distribute through their networks. Additional participants were recruited via word-of-mouth through individuals and organizations associated with mental health disaster response.

Participants completed one web-based series of instruments that included a demographic questionnaire, the Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1997), the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), the Attachment Styles Questionnaire (ASQ; Feeney et al., 1994), and the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). The demographic questionnaire was completed first and the order of the remaining instruments was randomized to avoid ordering effects.

The psychometric properties of the four instruments are discussed below. The demographic questionnaire and the four study instruments are included in Appendix B. Permissions from the authors to use all four instruments are included in Appendix C. In total, the four assessments included 137 Likert scale items and took participants an average of 15-40 minutes to complete.

### **The Impact of Event Scale-Revised (IES-R)**

PTSD symptom severity was assessed using the Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1997). The original Impact of Event Scale (IES) was



developed by Horowitz et al. (1979) to assess two core diagnostic indicators of PTSD: intrusion and avoidance (included as subscales of the original IES) but was published just before the release of the *DSM-III* (3rd ed.; APA, 1980), which added a third core indicator, hyperarousal, to the diagnostic profile for PTSD (Weiss & Marmar, 1997). Accordingly, Weiss and Marmar's (1997) revision, the IES-R, included subscales for all three indicators of PTSD. It should be noted that the most recent revision of the *DSM*, the *DSM-5* (5<sup>th</sup> ed.; APA, 2013) includes some minor adjustments to the wording of PTSD criteria. The two original diagnostic criteria, intrusion and avoidance, remain intact, while the third *DSM-III* criterion of hyperarousal has been encompassed in two new diagnostic standards: (a) negative alterations in cognitions and mood and (b) alterations in arousal and reactivity.

The IES-R contains 22 items rated on a 5-point Likert-type scale. Respondents rate representative statements related to trauma symptoms based on how distressing those symptoms have been in the past 7 days, from 0 (*not at all*) to 4 (*extremely*). It contains three subscales: (a) intrusion, (b) avoidance, and (c) hyperarousal. *Intrusion* is defined as persistent re-experiencing of a traumatic event (e.g., Any reminder brought back feelings about [the trauma]). *Avoidance* is defined as persistent avoidance of stimuli associated with a traumatic event and numbing of general responsiveness (e.g., I felt as if [the trauma] hadn't happened or wasn't real). *Hyperarousal* is defined as persistent symptoms of increased arousal (e.g., I was jumpy and easily startled). The IES-R requires reference to a specific traumatic event (Weiss & Marmar, 1997). Participants in the current study

were therefore instructed to consider any trauma that resulted from their most impactful disaster response episode in completing the IES-R.

The IES-R yields a total sum score ranging from 0-88 and three subscale scores. The unit of analysis for the present study was the full scale score. Beck et al. (2008) reported good internal consistency for the full scale at .95 and for all subscales (intrusion = .87-.94, avoidance = .84-.87, and hyperarousal = .79-.91). The IES-R also has good test-retest reliability (.89-.94 over a 6-month interval), evidence of concurrent validity with measures of anxiety and depression, and discriminant validity between individuals with and without a PTSD diagnosis (Beck et al., 2008; Weiss & Marmar, 1997).

### **Difficulties in Emotion Regulation Scale (DERS)**

ER was measured using the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS is based on Gratz and Roemer's (2004) four dimensions of ER: (a) awareness and understanding of emotions, (b) acceptance of emotions, (c) the ability to engage in goal-directed behavior and to refrain from impulsive behavior when experiencing negative emotions, and (d) access to emotion regulation strategies perceived as effective. ER is not analogous to emotion control. Rather, it relates to one's ability to monitor and evaluate emotional experiences in order to inform thoughts and actions (Gratz & Roemer, 2004).

The DERS contains 36 items on a 5-point Likert-type scale that are rated from 1 (*almost never*) to 5 (*almost always*). It is meant to assess difficulties in ER. Therefore, a high score on the DERS reflects low overall ER. The DERS yields a total sum score (ranging from 36-180) as well as six scores for the following subscales: (a)

nonacceptance, (b) goals, (c) impulse, (d) awareness, (e) strategies, and (f) clarity. The *nonacceptance* subscale is defined as nonacceptance of emotional responses (e.g., When I'm upset, I feel guilty for feeling that way). The *goals* subscale is defined as difficulties engaging in goal-directed behavior (e.g., When I'm upset, I have difficulty focusing on other things). The *impulse* subscale is defined as impulse control difficulties (e.g., When I'm upset, I lose control over my behaviors). The *awareness* subscale is defined as lack of emotional awareness (e.g., When I'm upset, I acknowledge my emotions [Reverse scored]). The *strategies* subscale is defined as limited access to emotion regulation strategies (e.g., When I'm upset, I believe that I will remain that way for a long time). Finally, the *clarity* subscale is defined as lack of emotional clarity (e.g., I have difficulty making sense out of my feelings). The full-scale score is a global measure of emotion regulation and was used as the unit of analysis for this study.

The DERS has marginal test-retest reliability (.57-.89 over a period of 4-8 weeks; Gratz & Roemer, 2004), good internal consistency (overall score = .93; each subscale > .80), and adequate construct and predictive validity (Gratz & Roemer, 2004). The DERS has been widely used in empirical studies of ER (e.g., Ehring & Quack, 2010).

### **Attachment Styles Questionnaire (ASQ)**

AAS was assessed using the Attachment Styles Questionnaire (ASQ; Feeney et al., 1994), which is based on social cognitive models for adult attachment proposed by Hazan and Shaver (1987) and Bartholomew (1990). The ASQ contains 40 items measured on a 6-point Likert-type scale. Respondents rate items from 1 (*totally agree*) to 6 (*totally disagree*). It is meant to assess general attachment patterns and is not specific to

a particular close relationship, as are many other measures of adult attachment (Stein et al., 1998).

Initial principle-components analysis of the ASQ yielded three-factor and five-factor models of adult attachment (Feeney et al., 1994). A subsequent factor analysis conducted by Karantzas, Feeney, and Wilkinson (2010) produced a nested factor model, suggesting two new first-order dimensions - attachment anxiety and attachment avoidance - within which the original five-factor model can be situated, thus creating a more parsimonious two-factor model. Karantzas et al. (2010) suggested that this two-factor nested model produced the best fit relative to other models tested.

For purposes of this study, the first-order dimensions of the nested two-factor model were used for analysis. These dimensions are: (a) anxiety and (b) avoidance. Karantzas et al. (2010) provide the following definitions for each factor. *Anxiety* is defined as an individual's excessive need for reassurance, fear of rejection, and a desire to merge with relationship partners (e.g., I find it hard to make a decision unless I know what other people think). *Avoidance* is defined as the extent to which an individual avoids intimacy and is distrusting of others (e.g., If you've got a job to do, you should do it no matter who gets hurt). Mean scores for the anxiety and avoidance scales were used as continuous units of analysis for this study.

Karantzas et al. (2010) defined attachment *security* as relative stability in attachment behaviors and the absence of either anxiety or avoidance. Because AAS, in the context of the two-factor nested model of the ASQ, is defined as the absence of either anxiety or avoidance, scores on each of these scales are negatively correlated with AAS.

In other words, lower scores on either anxiety or avoidance indicate higher levels of AAS. The ASQ has strong test-retest reliability for the original five-factor model (.67-.78 over 10 weeks), good internal consistency for the two-factor nested model (.83 for avoidance and .85 for anxiety), and convergent validity with other attachment scales (Karantzas et al., 2010; Ravitz et al., 2010; Stein et al., 1998).

### **Five Facet Mindfulness Questionnaire (FFMQ)**

Mindfulness was assessed using the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). The FFMQ contains 39 items rated on a 5-point Likert-type scale. It assesses individual differences in the frequency of mindful states over time (Baer et al., 2008). Items are based on five facets of a general tendency to be mindful in daily life. These five facets were derived from items on five preexisting self-report mindfulness assessments and were developed through exploratory factor analysis using a large student sample ( $n = 613$ ; Baer et al., 2006). Respondents to the FFMQ are asked to indicate the degree to which a statement in each item is true for them, from 1 (*never or very rarely true*) to 5 (*very often or always true*).

The FFMQ contains five subscales based on the five facets of mindfulness identified through Baer et al.'s (2006) factor analysis: (a) observing, (b) describing, (c) acting with awareness, (d) nonjudging of inner experience, and (e) nonreactivity to inner experience. These five facets/subscales were defined as follows by Baer et al. (2008). *Observing* is defined as one's ability to notice or attend to internal and external experiences (e.g., I notice the smells and aromas of things). *Describing* is defined as one's ability to label internal experiences with words (e.g., I am good at finding words to

describe my feelings). *Acting with awareness* is defined as one's ability to attend to activities in which he or she is engaged in the present moment (as opposed to acting mechanically while attention is directed elsewhere; e.g., I find myself doing things without paying attention [Reverse scored]). *Nonjudging of inner experience* is defined as one's ability to adopt a nonevaluative stance toward her or his thoughts and feelings (e.g., I think some of my emotions are bad or inappropriate and I should not feel them [Reverse scored]). Finally, *nonreactivity to inner experience* is defined as the tendency to allow thoughts and feelings to come and go, without becoming distracted by them (e.g., I perceive my thoughts and emotions without having to react to them). The FFMQ provides scores for the five facets of mindfulness as well as an overall mindfulness score (ranging from 39-195). The overall score served as the unit of analysis for this study.

Baer et al. (2006) reported that the five factors of mindfulness identified through their exploratory factor analysis accounted for 33% of variance, and confirmatory factor analyses have supported this model as a good fit. They reported acceptable internal consistency for the full scale (.96) and for all five FFMQ subscales: (a) observing = .83, (b) describing = .91, (c) acting with awareness = .87, (d) nonjudging = .87, and (e) nonreactivity = .75. Baer et al. (2006) also reported good construct, convergent, and discriminant validity based on correlations between the FFMQ subscales and other constructs.

### **Demographic Questionnaire**

A demographic questionnaire created by the researcher was used to assess the following relevant information: age, gender, race/ethnicity, professional affiliation,

highest level of education, number of disaster events to which each participant responded, history of previous trauma and related symptoms, length of time since last response, and debriefing experience (formal and/or informal). For each disaster response (up to 20), participants were asked to indicate the perceived severity of the disaster using Fischer's (2003) Disaster Scale Categories (DC-1 through DC-10; see Table 1) and the approximate distance (in miles) between their residence and the disaster location. Additionally, participants were asked in an open-ended format to indicate whether they would still be willing to provide professional services following a disaster and, if not, what factors led to this decision. A copy of the demographic questionnaire is included in Appendix B.

### **Data Analysis**

Descriptive statistics were used to create a profile of the study sample based on data from the demographic questionnaire. Alpha coefficients were calculated to determine the reliability of each of the instruments for this sample. The following analyses were then used to test each of the study hypotheses.

Independent samples t-tests were used to test hypothesis 1 (MHDRs' PTSD scores will not differ significantly from those of other trauma-exposed populations). To address this hypothesis, mean sum scores on the IES-R were compared with mean scores from the following trauma-exposed populations: burn victims (Sveen et al., 2010) and individuals dually diagnosed with PTSD and substance dependence (Rash, Coffey, Baschnagel, Drobles, & Saladin, 2008). These groups were chosen for comparison from

studies that also used the total sum scale of the IES-R to assess PTSD. No studies were available that used this measure to assess PTSD among disaster responders.

Hypothesis 2a (ER, AAS, and mindfulness, independently, will each significantly predict PTSD scores in a negative direction) and hypothesis 2b (ER will account for more unique variance in PTSD scores than either AAS or mindfulness when the three factors are examined within the same model) were each tested using multiple linear regression analyses. In addressing hypotheses 2a and 2b, a stepwise regression using forward selection was used to determine possible covariates. The covariates tested included the following: (a) age, (b) gender, (c) race/ethnicity, (d) professional affiliation, (e) level of education, and (f) history of previous trauma or other trauma-related diagnoses. These covariates were chosen because they were commonly assessed in similar studies of disaster mental health outcomes or because they were likely to confound assessment of PTSD severity. Additional analyses were run as partial correlations in order to control for those covariates that significantly predicted PTSD. The remainder of the regression analyses conducted to address hypotheses 2a and 2b tested for independent main effects of each of the predictor variables (ER, AAS, and mindfulness) as well as semi-partial correlations (unique variance accounted for by each predictor) in a full model where all predictors were entered.

Hypothesis 3 (Total number of disaster responses, previous trauma history, perceived scale of disasters to which participant previously responded, and proximity of those disasters to the participant's residence will each interact with the predictive relationships between ER and PTSD, between AAS and PTSD, and between mindfulness



and PTSD) was tested using multiple linear regression. The regression analyses used to address hypothesis 3 were similar to the main effects analyses used for hypotheses 2a and 2b but went one step further to test interaction effects for potential moderators in the regression model.

For hypothesis 4a (ER significantly mediates the relationship between AAS and PTSD) and hypothesis 4b (ER significantly mediates the relationship between mindfulness and PTSD), ER was tested as a mediating factor using Baron and Kenny's (1986) procedure for testing mediation using multiple linear regression. This procedure has three steps. First, the proposed mediating variable (ER) was regressed onto each of the predictor variables (AAS/mindfulness) to test for predictive significance. In both cases, a significant relationship was expected. Second, the criterion variable (PTSD) was regressed onto each of the predictor variables (AAS/mindfulness) separately to confirm an existing predictive relationship. If significant relationships were confirmed in this step, a third set of regression analyses would be run to evaluate ER as a potential mediator in each case. For this last set of analyses, ER was entered into the previously tested regression models from step two of Baron and Kenny's (1986) procedure. If the addition of ER into each of these models greatly reduced the significance of the relationships between the predictor variables (AAS/mindfulness) and the criterion variable (PTSD), then mediating effects would be confirmed.

The magnitude of each effect for the independent samples t-tests was assessed using Cohen's  $d$  to measure effect size. Cohen's  $d$  is calculated using the following formula:  $d = \frac{\bar{x}_1 - \bar{x}_2}{s}$  where  $s$  = standard deviation,  $\bar{x}_1$  = mean IES-R sum scores for

MHDRs, and  $\bar{x}_2$  = mean IES-R sum scores for other trauma-exposed groups based on previous studies (Rash et al., 2008; Sveen et al., 2010).

The significance of predictive relationships in all multiple regression analyses was assessed in two phases. First, the predictive significance of the overall models was determined using the multiple regression coefficient ( $R^2_{adj}$ ). Second, for those models where  $R^2_{adj}$  is significantly different from zero, standardized regression coefficients ( $\beta$ ) were used to determine the significance of each predictor variable's contribution to the overall model. In addition to significance, the magnitude of each effect for hypotheses 2a-3 was assessed using  $R^2$  as a measure of effect size.  $R^2$  is calculated using the following formula:  $R^2 = 1 - \frac{SS_{res}}{SS_{tot}}$  where  $SS_{res}$  = residual sum of squares and  $SS_{tot}$  = total sum of squares. Thompson (1998) and others have argued for the importance of reporting effect size alongside significance tests in order to most accurately represent the results of quantitative studies. Because sample size can readily impact the results of significance tests, inclusion of effect size calculations helps guard against misinterpretation. Effect sizes for hypotheses 4a and 4b were also calculated using  $R^2$ , as recommended by Fairchild, Mackinnon, Taborga, and Taylor (2009) for models of mediation.

**Table 2*****Hypotheses, Variables, and Data Analyses***

<b>Hypothesis</b>	<b>IV</b>	<b>DV</b>	<b>Analysis</b>
<u>Hypothesis 1:</u> MHDRs' PTSD scores will not differ significantly from those of other trauma-exposed populations.	N/A	PTSD symptoms	Independent Samples t-Tests
<u>Hypothesis 2a:</u> ER, AAS, and mindfulness, independently, will each significantly predict PTSD scores in a negative direction.	Emotion regulation, Adult attachment security, Mindfulness	PTSD symptoms	Multiple Linear Regression
<u>Hypothesis 2b:</u> ER will account for more unique variance in PTSD scores than either AAS or mindfulness when the three factors are examined within the same model.	Emotion regulation, Adult attachment security, Mindfulness	PTSD symptoms	Multiple Linear Regression
<u>Hypothesis 3:</u> Total number of disaster responses, previous trauma history, perceived scale of disasters to which participant previously responded, and proximity of those disasters to the participant's residence will each interact with the predictive relationships between ER and PTSD, between AAS and PTSD, and between mindfulness and PTSD.	Emotion regulation, Adult attachment security, Mindfulness, Demographic factors related to: Age, Gender, Race/Ethnicity Professional Affiliation and Education Time as a Licensed Professional Past Work with Trauma Previous disaster responses Debriefing	PTSD symptoms	Multiple Linear Regression
<u>Hypothesis 4a:</u> ER significantly mediates the relationship between AAS and PTSD.	Adult attachment security (predictor) Emotion regulation (mediator)	PTSD symptoms (criterion)	Multiple Linear Regression
<u>Hypothesis 4b:</u> ER significantly mediates the relationship between mindfulness and PTSD.	Mindfulness (predictor) Emotion regulation (mediator)	PTSD symptoms (criterion)	Multiple Linear Regression

**Pilot Study**

A pilot study was conducted to field test the instrumentation and procedures to be used in the full study. The first research question of the full study was analyzed using pilot study data in order to test data analysis procedures for the full study. (*Note:* Changes were made to research question 1 at the recommendation of the doctoral committee following completion of the pilot study. The original research question 1 can be found in Appendix D.) Other research questions were not analyzed for the pilot study because of the small sample size.

## Participants

The pilot study sample included 4 licensed professional counselors who reported delivering professional services on-site in the aftermath of at least one disaster in the past 3 years. All of the pilot participants were female and their average age was 44. Additional demographic information is summarized in Table 1 of Appendix D.

## Instruments

Participants completed a web-based survey that included the demographic questionnaire, the Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1997), the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), the Attachment Styles Questionnaire (ASQ; Feeney et al., 1994), and the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). Participants in the pilot study also were asked at the end of the survey to provide open-ended feedback about the duration of survey completion and about their overall experience completing the survey, including any items that were confusing or unclear.

PTSD severity was assessed using the IES-R. The IES-R contains 22 items rated on a 5-point Likert-type scale. Respondents rate representative statements related to trauma symptoms based on how distressing those symptoms have been in recent weeks, from 0 (*not at all*) to 4 (*extremely*). The IES-R has three subscales that include *intrusion* (e.g., Any reminder brought back feelings about [the trauma]), *avoidance* (e.g., I felt as if [the trauma] hadn't happened or wasn't real), and *hyperarousal* (e.g., I was jumpy and easily startled). It requires reference to a specific traumatic event (Weiss & Marmar, 1997). Participants in the pilot study were instructed to consider trauma symptoms that

resulted from their most recent disaster response episode (these instructions were later changed for the full study at the recommendation of the doctoral committee). Beck et al. (2008) reported good internal consistency for the full scale at .95 and for all subscales (intrusion = .87-.94, avoidance = .84-.87, and hyperarousal = .79-.91). The IES-R also has good test-retest reliability (.89-.94 over a 6-month interval), evidence of concurrent validity with measures of anxiety and depression, and discriminant validity between individuals with and without a PTSD diagnosis (Beck et al., 2008; Weiss & Marmar, 1997).

ER was measured using the DERS. The DERS contains 36 items on a 5-point Likert-type scale that are rated from 1 (*almost never*) to 5 (*almost always*). It is meant to assess difficulties in ER. Therefore, a high score on the DERS reflects low overall ER. The DERS yields a total score as well as six scores for the following subscales: *goals* (e.g., When I'm upset, I have difficulty focusing on other things), *impulse* (e.g., When I'm upset, I lose control over my behaviors), *awareness* (e.g., When I'm upset, I acknowledge my emotions [Reverse scored]), *strategies* (e.g., When I'm upset, I believe that I will remain that way for a long time), and *clarity* (e.g., I have difficulty making sense out of my feelings). The DERS has marginal test-retest reliability (.57-.89 over a period of 4-8 weeks; the authors note a small sample size for this calculation; Gratz & Roemer, 2004), good internal consistency (overall score = .93; each subscale > .80), and adequate construct and predictive validity (Gratz & Roemer, 2004). The DERS has been used liberally in empirical studies of ER (e.g., Ehrling & Quack, 2010).

AAS was assessed using the ASQ. The ASQ contains 40 items measured on a 6-point Likert-type scale. Respondents rate items from 1 (*totally agree*) to 6 (*totally disagree*). It is meant to assess general attachment patterns and is not specific to a particular close relationship, as are many other measures of adult attachment (Stein et al., 1998). For purposes of this study, the first-order dimensions of the nested two-factor model were used for analysis. These dimensions include *anxiety* (e.g., I find it hard to make a decision unless I know what other people think) and *avoidance* (e.g., If you've got a job to do, you should do it no matter who gets hurt). In the context of the two-factor nested model of the ASQ, AAS is defined as the absence of either anxiety or avoidance (Karantzas et al., 2010). The ASQ has strong test-retest reliability for the original five-factor model (.67-.78 over 10 weeks), good internal consistency for the two-factor nested model (.83 for avoidance and .85 for anxiety), and convergent validity with other attachment scales (Karantzas et al., 2010; Ravitz et al., 2010; Stein et al., 1998).

Mindfulness was assessed using the FFMQ. The FFMQ contains 39 items rated on a 5-point Likert-type scale. It assesses individual differences in the frequency of mindful states over time (Baer et al., 2008). Respondents to the FFMQ are asked to indicate the degree to which a statement in each item is true for them, from 1 (*never or very rarely true*) to 5 (*very often or always true*). The FFMQ has five subscales that include *observing* (e.g., I notice the smells and aromas of things), *describing* (e.g., I am good at finding words to describe my feelings), *acting with awareness* (e.g., I find myself doing things without paying attention [Reverse scored]), *nonjudging of inner experience* (e.g., I think some of my emotions are bad or inappropriate and I should not feel them

[Reverse scored]), and *nonreactivity to inner experience* (e.g., I perceive my thoughts and emotions without having to react to them). Baer et al. (2006) reported acceptable internal consistency for the full scale (.96) and for all five FFMQ subscales: (a) observing = .83, (b) describing = .91, (c) acting with awareness = .87; (d) nonjudging = .87, and (e) nonreactivity = .75. Baer et al. (2006) also reported good construct, convergent, and discriminant validity based on correlations between the FFMQ subscales and other constructs.

A demographic questionnaire was created by the researcher to collect relevant information including age, gender, race/ethnicity, professional affiliation, highest level of education, number of disaster events to which each participant has responded, history of previous trauma, and length of time since last response. As part of the demographic questionnaire, participants were asked to provide a list of past disaster response experiences and details about those experiences including the perceived severity (based on scale, scope, and duration) of each disaster and the approximate distance between their residence and the disaster location. Additionally, participants were asked to indicate whether they would still be willing to provide professional services following a disaster and, if not, what factors led to this decision.

## **Procedures**

An online survey was constructed using Qualtrics<sup>®</sup> software. Permission to perform the pilot study was requested and approved by the University of North Carolina at Greensboro's Institutional Review Board (See Appendix A). After approval was obtained, a recruitment e-mail was sent to a mental health professional who previously

expressed interest in the study and who agreed to assist in recruitment. This individual circulated the recruitment e-mail to other mental health professionals known to have responded to disaster events in the same geographic area within the past 5 years. The recruitment e-mail included a link to the web-based survey. The pilot surveys took between 15 and 60 minutes to complete. Data were uploaded from Qualtrics<sup>®</sup> into an Excel spreadsheet and an SPSS database (SPSS, 2011). Although the pilot study sample size was inadequate for meaningful analyses, the results of the first research question (edited following the pilot study) are reported in Appendix D. Research questions 2, 3, and 4 were not analyzed due to small sample size.

Although no meaningful conclusions can be drawn from a sample of only 4 participants, the pilot data yielded some notable findings. First, scores on the IES-R were very low and minimally variable, indicating that the pilot sample did not experience significant impairment as a result of their disaster response work. Second, the homogeneity of this sample may have biased some results. Third, variation in the way participants rated the same disasters on Fischer's (2003) disaster scale warrants further investigation in the full study, as this scale has not been empirically explored. Finally, participants reported some surprisingly long disaster response durations that are not consistent with the average length of disaster response documented in current literature.

### **Adjustments to Full Study Based on Pilot Study**

Overall, the field testing was successful and administration of the study survey ran smoothly. Timing estimates between 30 and 60 minutes for the complete survey were consistent with reports from all pilot participants. A few adjustments were made to the



full study based on pilot participants' feedback. First, the instructions preceding the IES-R were changed to direct participants to consider their most impactful disaster response rather than their most recent. This change is related to feedback from one participant that these instructions were confusing. Additionally, participants may have underreported symptoms of PTSD simply because the IES-R instructions directed them to consider only their most recent response, which may not have been the most impactful. Second, the question about past work with trauma clients in the demographic questionnaire, "Approximately how many years/months have you spent working with issues specific to trauma with at least one client?" was re-worded for clarification. The new item read as follows: "Please estimate the amount of time (years/months) that you have spent working with at least one trauma-affected client."

Some additional changes were made to the final study at the recommendation of the dissertation committee. The following questions were added to the demographic questionnaire: Questions about the amount of time participants had been working as licensed professionals and working specifically with trauma, questions about specific training in disaster mental health, questions about formal and informal debriefing. Changes were also made to research questions 1 and 2 and to hypotheses 1, 2a, and 2b in order to clarify the purpose of analyses and to enhance the external validity of the study. The original wording of the research questions and hypotheses before these changes were made can be found in Appendix D. The updated wording is included elsewhere in this manuscript.

## **CHAPTER IV**

### **RESULTS**

The primary purpose of this study was to assess the severity of PTSD symptoms among MHDRs. A secondary purpose was to investigate whether ER, AAS, and mindfulness – coping-related factors known to predict PTSD in other trauma-exposed populations – also predict PTSD among MHDRs and, if so, to test a mediating model of PTSD using AAS and mindfulness as potential predictors and ER as a proposed mediator. The results of the study are presented in this chapter. They include demographic data describing the study sample, descriptive statistics, reliability coefficients of the measures used, and results of the analyses used to test each hypothesis.

#### **Description of Sample**

Participants were recruited via word-of-mouth and postings on social networking groups related to disaster and mental health. Recruitment scripts encouraged participants to forward information about the study to others who may be eligible. Participants were not asked about how they learned of the survey or where they resided geographically. Little is known, therefore, about specific sampling sources. Snowball sampling ultimately produced an initial sample size of 182. Data from 10 participants were excluded from analyses because these participants responded “No” to at least one of the following questions: (a) Are you a U.S. citizen? (b) Do you hold a current license in good standing in a professional mental health field? This yielded a final sample size of 172 eligible

participants. An a priori power analysis indicated a minimum sample size of 118 for estimated power of .80 and a medium effect size of  $f^2 = .15$  (Faul et al., 2009). This calculation was based on the analysis for research question 2, which required the largest sample.

Prior to beginning data analysis and in accordance with scale developers' instructions, certain items for the IES-R, DERS, ASQ, and FFMQ were reverse coded before total scale values were computed. Early exploratory analyses revealed that there were no missing data for any of the four main measures. There were, however, missing data points for many of the questions asked as part of the demographic questionnaire. For analyses that utilized demographic data, these participants were not included. Related limitations are discussed in Chapter V.

In addition to data from the four instruments used in the study survey (IES-R, DERS, ASQ, and FFMQ), demographic data were collected, including age, gender, race/ethnicity, relationship status, highest level of education, and professional orientation. Additional demographic information related to each participant's experiences as a MHDR also was gathered. Specifically, participants were asked for information about their level of professional experience, disaster response training, characteristics of the disasters to which they had responded, self-assessment of mental and emotional difficulties preceding and following their disaster response work, debriefing experiences (formal and/or informal), and willingness to respond in the future. Demographics were calculated for the study sample and are included in Tables 3 and 4.

The 172 participants included in study analyses indicated that they were all licensed mental health professionals, U.S. citizens, and mental health disaster responders. Although inclusion criteria asserted that eligible participants must have responded to at least one disaster within the past five years, only 28 participants responded to a question about this on the survey. Of those who responded, 3 participants indicated that their last disaster response had taken place more than five years ago. These participants were not excluded from data analyses. Their inclusion, however, is considered a limitation of the study.

**Table 3**

***Demographic Description of the Full Study Sample (N = 172)***

Variable	<i>M</i>	<i>SD</i>	<i>n</i>	%
Age	57.76	10.42		
Gender				
Female			109	63.4%
Male			62	36.0%
Other (unspecified)			1	0.6%
Race/Ethnicity				
White			152	88.4%
Black/African American			8	4.7%
Asian			4	2.3%
Hispanic/Latino			5	2.9%
Not Hispanic/Latino			2	1.2%
Other (unspecified)			1	0.6%
Relationship Status				
Married			111	64.5%
Single			19	11.0%
Divorced			19	11.0%
Partnered and Cohabiting			16	9.3%
Partnered Not Cohabiting			6	3.5%
Not indicated			1	0.6%
Level of Education				
Master's			102	59.3%
Doctorate			60	34.9%
Other (unspecified)			10	5.8%
Professional Identity				
Counselor			73	42.4%
Social Worker			44	25.6%
Psychologist			28	16.3%
Marriage/Couples and Family Therapist			15	8.7%
Psychiatrist			1	0.6%
Other (e.g., psychiatric nurse, art therapist)			10	5.8%
Not indicated			1	0.6%

**Table 4*****Demographic Description of Factors Related to Disaster Response Work (N = 172)***

<b>Variable</b>	<b><i>M</i></b>	<b><i>SD</i></b>	<b><i>Mdn</i><sup>*</sup></b>	<b><i>IQR</i><sup>*</sup></b>	<b><i>n</i></b>	<b>%</b>
Time Working as a Licensed Mental Health Professional	21.14 yrs	10.01yrs				
Time Working with Trauma	15.23 yrs	10.43yrs				
Formal Training in Disaster Response						
Yes					161	93.6%
No					11	6.4%
Time Since Most Recent Disaster Training	3.52yrs	3.79yrs				
Number of Disaster Responses	24.19	8.8	4.00	8.75		
Disaster Response Duration	4.94mos	15.05mos	4ds	13ds		
Disaster Scale (DC) Rating (1-10)	4.29	2.25				
Proximity of Disasters to Primary Residence						
<15 miles					217	27.5%
15-50 miles					256	32.5%
50-100 miles					84	10.7%
100-300 miles					75	9.5%
300+ miles					156	19.8%
Time Since Last Response	1.89yrs	2.53yrs				
Symptoms Experienced Prior to First Disaster Response						
PTSD					16	9.3%
Depression					32	18.6%
Other Anxiety Disorder (not PTSD)					21	12.2%
Substance Abuse or Dependence					6	3.5%
Other (e.g., sleep disturbance, acute stress disorder)					26	15.1%
Symptoms Experienced Since First Disaster Response						
PTSD					15	8.7%
Depression					27	15.7%
Other Anxiety Disorder (not PTSD)					22	12.8%
Substance Abuse or Dependence					3	1.7%
Other (e.g., emotional lability, fatigue, disorientation)					26	15.1%
Other Traumatic Events (not related to disaster response)						
Prior to most impactful disaster response					73	42.7%
Since most impactful disaster response					53	30.8%
Post-Disaster Debriefing						
Formal					97	56.4%
Informal					143	83.1%
Believe they suffered traumatic stress from response work					33	19.2%
Would be willing to respond again					168	97.7%

<sup>\*</sup>Median and interquartile range are reported alongside *M* and *SD* for factors with extreme data outliers.

The average age of participants was 57.76 (*SD* = 10.41). The majority of participants were female (*n* = 109, 63.4%). Thirty-six percent were males (*n* = 62) and 1 participant (0.6%) identified as “Other” gender but did not specify. Most participants

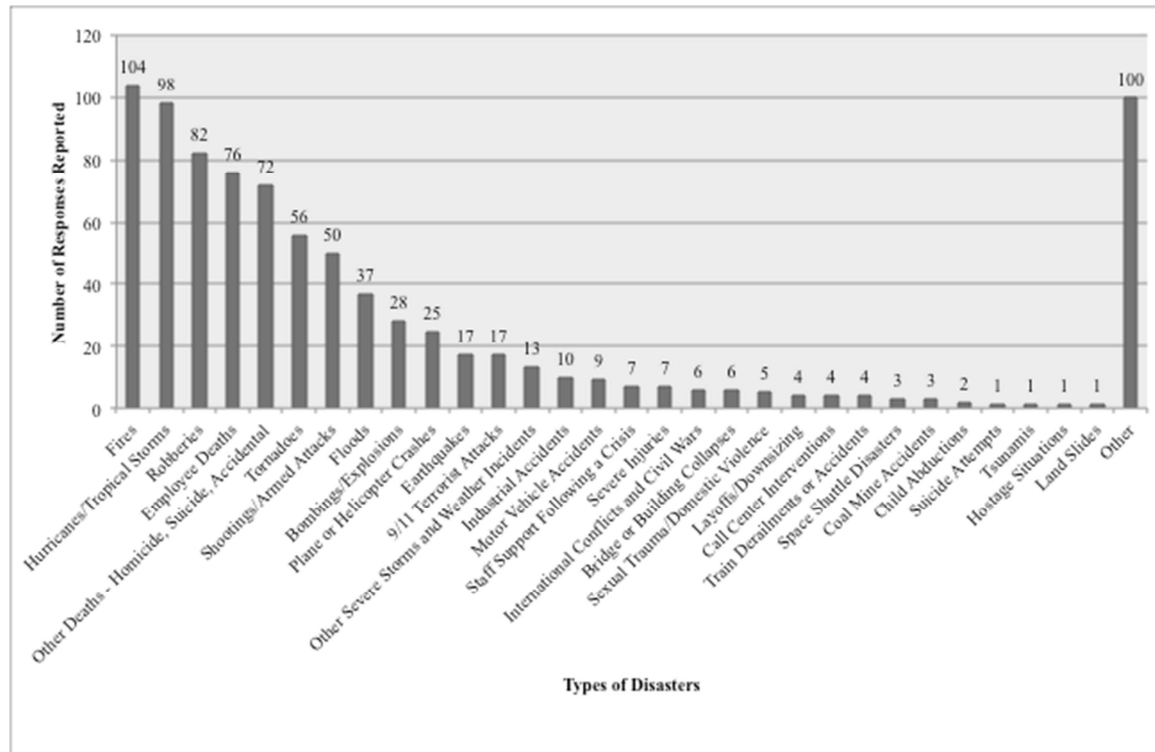
were White ( $n = 152$ , 88.4%) with smaller percentages identifying as Black or African American ( $n = 8$ , 4.7%), Asian ( $n = 4$ , 2.3%), Hispanic/Latino ( $n = 5$ , 2.9%), and “Other,” unspecified ( $n = 1$ , 0.6%). In terms of relationship status, married participants made up the highest percentage of the sample ( $n = 111$ , 64.5%) along with single ( $n = 19$ , 11.0%), divorced ( $n = 19$ , 11.0%), and partnered ( $n = 22$ , 12.8%) participants. Among those who were partnered, 9.3% ( $n = 16$ ) cohabitated with their partners and 3.5% ( $n = 6$ ) did not. One participant (0.6%) did not indicate relationship status. The highest level of education for 59.3% ( $n = 102$ ) of participants was a master’s degree and 34.9% ( $n = 60$ ) of participants had attained a doctoral degree. Ten participants reported having a different level of education (5.8%) but none of these 10 specified further. The majority of participants identified as professional counselors ( $n = 73$ , 42.4%), followed by social workers ( $n = 44$ , 25.6%), psychologists ( $n = 28$ , 16.3%), marriage or couples and family therapists ( $n = 15$ , 8.7%), and “Other” types of licenses ( $n = 10$ , 5.8%; “Other” responses included psychiatric nurse, art therapist, and related fields). One participant (0.6%) identified as a psychiatrist and 1 (0.6%) did not indicate a professional orientation.

Because little is known about the MHDR population specifically, considerable information was gathered about participants’ professional backgrounds and experiences related to disaster response. At the time of survey completion, participants had been working as licensed mental health professionals for an average of 21.14 years ( $SD = 10.01$ ) and working with trauma in a professional capacity for an average of 15.23 years ( $SD = 10.43$ ). Most participants did have some formal training in disaster response ( $n = 161$ , 93.6%) and, on average, their last response training took place 3.52 years ( $SD =$

3.79) before study participation. Participants received training through many different organizations. The most frequently cited included ARC, American Counseling Association (ACA), Crisis Care Network, International Critical Incident Stress Foundation (ICISF), Critical Incident Stress Management (CISM) organizations, and government organizations including FEMA, the Department of Homeland Security, and the U.S. military. Participants received training in a wide variety of intervention and response modalities including Psychological First Aid, Critical Incident Stress Debriefing or Management (CISD/CISM), Eye Movement Desensitization and Reprocessing (EMDR), Trauma-Focused Cognitive-Behavioral Therapy (TF-CBT), and crisis counseling. Some participants referred to a handful of specific intervention models in which they had been trained. These included the Mitchell Model, the ICISF Model, and the NOVA Model.

Participants responded to an average of 24.19 ( $SD = 8.8$ ) disasters each. It is notable, though, that 75% ( $n = 129$ ) of participants responded to 10 or fewer disasters with a median of 4 disasters ( $n = 86$ ,  $IQR = 8.75$ ) reported. The mean was weighted by 3 participants who responded to 250, 500, and 987 disasters, respectively. Separately, participants were each asked to provide details about up to 20 disaster responses. Altogether, participants provided details for 849 distinct response events. The nature of these events ranged from high-profile, large-scale disasters like the 9/11 terrorist attacks in 2001, Hurricane Katrina in 2005, and the Virginia Tech shootings in 2007 to lower-profile but widespread disasters including tornadoes and other severe weather events to local, small-scale disasters such as house fires, robberies, and motor vehicle accidents.

The types of disasters to which participants responded and the number of responses reported are summarized in Figure 2.



**Figure 2. Disaster Response Events by Type of Disaster**

Participants' disaster responses averaged 4.94 ( $SD = 15.05$ ) months in duration although a few participants who reported responses lasting for multiple years (up to 11 years) skewed the mean calculation. For this reason, the median also was calculated. Fifty percent of participants reported average durations less than 5 days ( $n = 69$ ,  $IQR = 13.00$ ). Participants used Fischer's (2003) Disaster Scale (DC) Ratings to indicate the estimated severity of each disaster to which they responded based on scope, scale, and duration of the disaster. Mean DC scores across all participants' response events was 4.29 ( $SD =$



2.25) on a 10-point scale with 1 representing an “everyday emergency” such as a house fire and 10 representing “annihilation,” or the destruction of an entire society.

Participants also were asked to estimate how far each disaster was (in miles) from their primary residence. The greatest proportion of disasters ( $n = 256$ , 32.5%) occurred 15-50 miles from participants’ homes, while 27.5% ( $n = 217$ ) occurred less than 15 miles from the primary residence, 19.8% ( $n = 156$ ) occurred more than 300 miles away, 10.7% ( $n = 84$ ) occurred between 50 and 100 miles away, and 9.5% ( $n = 75$ ) occurred 100-300 miles away. Among those participants who indicated time since last response, the mean time since last disaster response was 1.89 years ( $n = 28$ ,  $SD = 2.53$ ).

Finally, participants provided some information about traumatic influences external to disaster response work as well as their thoughts about the impact of this work and their willingness to continue doing it. Sixty-seven participants (39%) reported preexisting mental health symptoms that have been related to traumatic stress. These included PTSD ( $n = 16$ , 9.3%), depression ( $n = 32$ , 18.6%), other anxiety disorders ( $n = 21$ , 12.2%), substance abuse or dependence ( $n = 6$ , 3.5%), and “Other” symptoms ( $n = 26$ , 15.1%) including sleep disturbance, muscle tremors, shortness of breath, sweating, Acute Stress Disorder (ASD), and Attention Deficit Hyperactivity Disorder (ADHD). Sixty-six participants (38%) reported trauma-related mental health symptoms that arose after their first disaster response: PTSD ( $n = 15$ , 8.7%), depression ( $n = 27$ , 15.7%), other anxiety disorders ( $n = 22$ , 12.8%), substance abuse or dependence ( $n = 3$ , 1.7%), and “Other” symptoms ( $n = 26$ , 15.1%) including sleep disturbance, labile emotions, disorientation, ASD, and fatigue. Seventy-three participants (42.7%) indicated that they

experienced a traumatic event not related to disaster response work prior to their most impactful disaster response and 53 (30.8%) reported experiencing such an event after their most impactful response. Participants were not asked to elaborate on any traumatic events they reported. However, these may have included things like a death in the family, a history of abuse or neglect, or exposure to other traumatic stimuli outside of their response work. Ninety-seven participants (56%) underwent formal debriefing following their disaster responses (i.e., support services set up by response organizations) while a much higher percentage ( $n = 143$ ; 83.1%) processed their experiences less formally with friends or family. Thirty-three participants (19%) believed that they suffered traumatic stress from their work as MHDRs and nearly all of the participants ( $n = 168$ ; 97.9%) indicated that they would respond to future disasters if needed. The small percentage who would not do disaster response work in the future pointed to age, declining health, the stress of the work, and frustration at not being able to adequately meet the needs of disaster survivors as reasons why they would not respond again.

### **Descriptive Statistics for Instrumentation**

Means and standard deviations were calculated for the full scales of the IES-R, DERS, and FFMQ and for the avoidance and anxiety subscales of the ASQ. Items on the DERS, FFMQ, and ASQ were reverse scored as indicated by the instrument creators. Weiss and Marmar (1997) did not report norms for the IES-R. Norms were drawn instead from Rash et al.'s (2008) study from which two comparison groups were drawn to test hypothesis 1. These norms are based on two groups of adults with substance dependence. One group had been given diagnoses of PTSD and the other had not. Mean scores across

both groups were used as norms. The mean for the current study ( $M = 6.77$ ,  $SD = 8.36$ ) was notably lower than that from the normed sample ( $M = 33.45$ ,  $SD = 26.18$ ). The DERS was normed on a sample of 373 undergraduate psychology students (Gratz & Roemer, 2004). Results of the current study yielded a mean score ( $M = 54.65$ ,  $SD = 13.02$ ) that is considerably lower than the DERS normed sample, for which descriptive statistics were calculated by gender ( $M = 77.99$  [ $SD = 20.75$ ] for women,  $M = 80.60$  [ $SD = 18.79$ ] for men). The original authors of the FFMQ also did not report norms for their instrument (Baer et al., 2006), so norms were drawn instead from a sample of British adults accessed through an online survey site in Goodall et al.'s (2012) correlational study using the FFMQ, the DERS, and a different measure of attachment security. The mean FFMQ score from the current study ( $M = 154.17$ ,  $SD = 17.67$ ) was higher and had greater variance than the normed mean ( $M = 129.19$ ,  $SD = 5.87$ ). The ASQ was originally normed on a group of undergraduate students. However, the two-factor nested model was proposed much later (Karantzas et al., 2010) in a study of Australian adults and adolescents. Norms for the avoidance and anxiety subscales were not reported and no known studies published to date have used the two-factor model. Norms, therefore, are not available for the two-factor model of the ASQ. See Table 5 for results.

**Table 5****Sample Score Ranges, Means, Standard Deviations, and Norms (N = 172)**

<b>Instrument</b>	<b>Possible Range</b>	<b>Sample Range</b>	<b>Scale <i>M</i></b>	<b>Scale <i>SD</i></b>	<b>Norm <i>M</i></b>	<b>Norm <i>SD</i></b>
Attachment Styles Questionnaire						
<b>Avoidance Scale</b>	1-6	1.19-4.13	2.68	0.60	-	-
<b>Anxiety Scale</b>	1-6	1.15-4.08	2.31	0.69	-	-
Difficulties in Emotion Regulation - <b>Full Scale</b>	36-180	36-138	54.56	13.02	79.30	27.97
Five Facet Mindfulness Questionnaire - <b>Full Scale</b>	39-195	95-188	154.17	17.67	129.19	5.87
Impact of Event Scale - Revised - <b>Full Scale</b>	0-88	0-44	6.77	8.36	33.45	26.18

Cronbach's alphas were computed as a measure of internal consistency for the full scales of the IES-R, DERS, and FFMQ and for the Avoidance and Anxiety subscales of the ASQ. Table 6 compares the alpha coefficients of the current study with published studies. Alpha coefficients for the measures ranged from .85 to .93, so all measures had evidence of acceptable reliability with the current sample.

**Table 6****Instrument Scale Reliabilities**

<b>Instrument</b>	<b># of items</b>	<b><math>\alpha</math> in previous studies</b>	<b><math>\alpha</math> in current study</b>
Attachment Styles Questionnaire	40	-	-
<b>Avoidance Scale</b>	16	0.83	0.85
<b>Anxiety Scale</b>	13	0.85	0.87
Difficulties in Emotion Regulation - <b>Full Scale</b>	36	0.93	0.93
Five Facet Mindfulness Questionnaire - <b>Full Scale</b>	39	0.96	0.93
Impact of Event Scale - Revised - <b>Full Scale</b>	22	0.95	0.92

**Research Questions and Hypotheses**

The goals of the study were twofold: (a) to assess the severity of PTSD symptoms among a sample of MHDRs and (b) to explore ER, AAS, and mindfulness as potential

predictors of PTSD within this population. Four research questions and six hypotheses were developed to address these goals.

Exploratory analyses revealed positively skewed data sets for the DERS (skewness = 2.40) and the IES-R (skewness = 1.73), violating the assumption of normality for regression analysis. A Log10 transformation was used to normalize both data sets (a constant was added to the transformation for the IES-R scores to account for values of 0 [ $\text{Log}_{10}(X + 50)$ ]). This resulted in the desired level of skewness (between -1.00 and 1.00) for the IES-R data (skewness = 0.60) but not for the DERS data (skewness = 1.10). Evaluation of leverage and influence (using Cook's  $d$ ) for the DERS data set revealed an outlier ( $M = 138$ , leverage = 0.24,  $d = .52$ ), which was subsequently removed. The resulting data set yielded an acceptable skewness of 0.72. Therefore, analyses for all research questions were run with 171 participants. Additionally, some concerns about multicollinearity and a violation of the assumption of homogeneity of variance for the ASQ Anxiety subscale (Levene's test = 1.63,  $p < .05$ ) arose. Implications of these limitations will be discussed in Chapter 5.

### **Research Question 1/Hypothesis 1**

Research question 1 explored the severity of trauma-related symptoms among MHDRs. Hypothesis 1 suggested that MHDRs would not score differently than other trauma-exposed populations on PTSD severity.

Independent samples t-tests were used to test for significant differences between mean IES-R scores among the study sample of MHDRs and two trauma-exposed groups assessed using the same PTSD measure in previous studies. These groups included burn

victims (Sveen et al., 2010) and individuals dually diagnosed with substance dependence and PTSD (Rash et al., 2008). Results of these analyses revealed that MHDRs' IES-R scores ( $M = 6.76$ ,  $SD = 8.36$ ) were significantly lower than Sveen et al.'s (2010) burn injury group ( $n = 147$ ;  $M = 36.3$ ,  $SD = 26.1$ ;  $t(316) = 13.99$ ,  $p < .01$ ,  $d = 1.52$ , power = 1.00) and Rash et al.'s (2008) group of individuals who were dually diagnosed with substance abuse disorders and PTSD ( $n = 71$ ;  $M = 45.4$ ,  $SD = 17.8$ ;  $t(240) = 22.97$ ,  $p < .01$ ,  $d = 2.78$ , power = 1.00). Interestingly, MHDRs also produced lower IES-R scores than a non-PTSD group of individuals with substance dependence diagnoses in Rash et al.'s (2008) study ( $n = 53$ ;  $M = 21.5$ ,  $SD = 19.2$ ;  $t(222) = 7.93$ ,  $p < .01$ ,  $d = 1.00$ , power = 1.00). See Table 7 for a summary of results.

**Table 7**

***Independent Samples t-Tests: IES-R Scores for MHDRs Compared to Other Trauma-Exposed Populations (N = 171)***

Sample	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> -value	Effect Size ( <i>d</i> )	Power
MHDRs ( $n = 172$ )	6.76	8.36	-	-	-	-
Burn victims ( $n = 147$ ) (Sveen et al., 2010)	36.3	26.1	13.99	0.00**	1.52	1.00
Substance dependence + PTSD ( $n = 71$ ) (Rash et al., 2008)	45.4	17.8	22.97	0.00**	2.78	1.00
Substance dependence, no PTSD ( $n = 53$ ) (Rash et al., 2008)	21.5	19.2	7.93	0.00**	1.00	1.00

\*\*Significance at  $p < .01$

## **Research Question 2/Hypotheses 2a-b**

Research question 2 inquired about the relationships between each of the predictor variables (ER, AAS, and mindfulness) and the criterion variable (PTSD), as

well as the proportion of variance in IES-R scores accounted for by each of the three predictor variables. Intercorrelations among the measures are displayed in Table 8.

**Table 8**

**Intercorrelations for IES-R and Proposed Predictors (N = 171)**

<b>Instrument</b>	<b>DERS</b>	<b>ASQ (Av)</b>	<b>ASQ (Anx)</b>	<b>FFMQ</b>
IES-R	0.210**	0.058	0.200**	-0.049
<b>Proposed predictors:</b>				
DERS	-	0.371**	0.699**	-0.761**
ASQ (Avoidance)		-	0.191*	-0.592**
ASQ (Anxiety)			-	-0.389**
FFMQ				-

\*Significance at  $p < .05$

\*\*Significance at  $p < .01$

Multiple linear regression analyses were used to explore independent main effects for scores on the DERS, ASQ subscales, and the FFMQ while controlling for two covariates that yielded significant correlations with IES-R scores – pre-disaster PTSD ( $r = .20, p < .01$ ) and pre-disaster depression ( $r = .16, p < .05$ ). All subsequent analyses for research questions 2-4 controlled for these covariates.

Regression analyses revealed significant independent main effects for DERS and ASQ-Anxiety scores (DERS:  $F(3, 170) = 5.27, p < .01, R^2_{adj} = .07$ , power = .82; ASQ-Anxiety:  $F(3, 170) = 4.93, p < .01, R^2_{adj} = .065$ , power = .79). Individually, each of these variables predicted a significant amount of variance in IES-R scores. Both DERS and ASQ-Anxiety scores predicted IES-R scores in a positive direction, which actually indicated a negative relationship between ER and PTSD and between AAS and PTSD as hypothesized. ASQ-Avoidance and FFMQ scores did not significantly predict scores on

the IES-R. Hypothesis 2a is not supported by these results, as only two of the three predictor variables (ER and AAS-Anxiety) independently predicted significant variance in PTSD scores. Independent main effects are displayed in Table 9.

**Table 9**

**Multiple Linear Regression Analyses for Independent Main Effects (N = 171)**

Variable	$\beta$	<i>p</i> -value	<i>R</i> <sup>2</sup>
Attachment Styles Questionnaire			
<b>Avoidance Scale</b>	0.04	0.59	0.04
<b>Anxiety Scale</b>	0.18	0.02*	0.07
Difficulties in Emotion Regulation - <b>Full Scale</b>	0.20	0.01*	0.07
Five Facet Mindfulness Questionnaire - <b>Full Scale</b>	-0.03	0.70	0.04

Note: *R*<sup>2</sup> indicates effect size for each standardized coefficient ( $\beta$ ).

\*Significance at  $p < .05$

A simultaneous regression model was then run with all four predictors. This combination of variables significantly contributed to the prediction. The adjusted  $R^2$  value for this model was 0.096, which indicates that 9.6% of the variance in IES-R scores was explained by the four predictors. This is a small to medium effect with adequate power of .84. Results are displayed in Table 10.

Semi-partial correlations (*spr*) were then examined for the full regression model in order to address hypothesis 2b that ER will account for more total variance in PTSD scores than either AAS or mindfulness. Results displayed in Table 8 do not support hypothesis 2b. When variance associated with other predictors is accounted for, FFMQ scores actually contributed a slightly greater proportion of variance in IES-R scores (18.4%) than scores on the DERS (18.2%). DERS scores did predict a greater proportion



of variance than scores on either ASQ-Avoidance (4.0%) or ASQ-Anxiety (11.6%). However, neither indicator of AAS is a significant contributor to the full model. Due to concerns about multicollinearity, the same model was run subsequently as a hierarchical regression in order to determine the best model fit for predicting PTSD from this set of variables and specifically to determine whether AAS-Avoidance or AAS-Anxiety might be a better predictor on its own than with the other AAS measure. The results of this analysis indicated that the inclusion of AAS-Avoidance actually reduced the predictive value of the regression model ( $\Delta R^2_{adj} = .004$ ) and that excluding it from the model yielded a slightly larger effect of  $R^2_{adj} = .10$ .

**Table 10**

***Multiple Linear Regression Analysis Summary for DERS, ASQ, and FFMQ Predicting IES-R Scores (N = 171)***

Variable	$\beta$	<i>p</i> -value	<i>spr</i>
DERS	0.32	0.01*	0.182
ASQ (Avoidance)	-0.05	0.59	0.040
ASQ (Anxiety)	0.18	0.11	0.120
FFMQ	-0.30	0.01*	0.184

Note:  $R^2 = .096$ ;  $F(6, 170) = 4.01$ ;  $p < .01$

*spr* = semi-partial correlation

\*Significance at  $p < .05$

### **Research Question 3/Hypothesis 3**

Research question 3 examined potential moderators among the numerous demographic data gathered from participants. Multiple linear regression analyses revealed three demographic factors that were significantly correlated with IES-R scores

after controlling for covariates: highest level of education – master’s ( $F(3, 170) = 5.512$ ,  $p_F < .01$ ;  $\beta = .199$ ,  $p_\beta < .01$ ), highest level of education – doctorate ( $F(3, 170) = 4.551$ ,  $p_F < .01$ ;  $\beta = -.157$ ,  $p_\beta < .05$ ), and informal debriefing following disaster response ( $F(3, 170) = 4.310$ ,  $p_F < .01$ ;  $\beta = .152$ ,  $p_\beta < .05$ ). Multiple linear regression was then used to test hypothesis 3, which stated that four factors would show significant interaction effects – number of disaster responses, previous trauma history, perceived severity of disasters, and proximity of disasters to participants’ homes. It was hypothesized, based on theoretical connections in the literature, that each of these four factors would significantly interact in the relationships between each of the predictors and IES-R scores. None of the potential moderators that were hypothesized proved to be significant predictors of PTSD. Additionally, none of the three potential moderators that did yield significant correlations showed significant interaction effects. The data did not support hypothesis 3. See Appendix E for a summary of results.

#### **Research Question 4/Hypotheses 4a-b**

Research question 4 explored ER as a potential mediator of the proposed relationships between AAS and PTSD and between mindfulness and PTSD. Because FFMQ scores did not independently predict IES-R scores in research question 2 and this is a requirement for mediation, ER was not tested as a mediator of mindfulness and PTSD. To test ER as a mediator between AAS and PTSD, a series of multiple regression analyses were used to test the proposed mediating model using the procedure described by Baron and Kenny (1986).

First, scores on the DERS were regressed on the ASQ-Anxiety subscale to confirm a significant predictive relationship ( $F(3, 170) = 58.66, p < .01, R^2_{adj} = .50$ , power = 1.0). Second, IES-R scores were regressed onto the ASQ-Anxiety subscale, confirming the significant relationship found in testing hypothesis 2a ( $F(3, 170) = 4.93, p < .01, R^2_{adj} = .065$ , power = .785). Finally, IES-R scores were regressed onto both DERS and ASQ-Anxiety scores in a simultaneous regression model. The inclusion of DERS scores resulted in a  $R^2_{adj}$  increase of .004, indicating added predictive value. The significance of ASQ-Anxiety as a predictor dropped dramatically from  $p = .02$  ( $\beta = -.178$ ) to  $p = .40$  ( $\beta = -.087$ ). DERS scores did not significantly predict IES-R scores in the full mediation model ( $\beta = -.136, p = .20$ ). This drop in significance supports the mediation model. Additionally, a Sobel test for significance of mediation indicated that the demonstrated mediation effect was statistically significant ( $t = 2.48, p < .05$ ). ER better accounts for the relationship between AAS (indicated by the absence of attachment anxiety) and PTSD. This finding supports hypothesis 4a. A summary of the analysis is included in Table 11.

**Table 11**

**Multiple Linear Regression Analysis Summary for ER as a Mediator between AAS and PTSD (N = 171)**

Variable	$\beta$	p-value
<b>Step 1:</b> DERS = ASQ (Anxiety)	0.081	0.00**
Note: $F(3, 170) = 5.27, p < .01, R^2 = .07, \text{power} = .82$		
<b>Step 2:</b> IES-R = ASQ (Anxiety)	0.068	0.02*
Note: $F(3, 170) = 4.93, p < .01, R^2 = .065, \text{power} = .79$		
<b>Step 3:</b> IES-R = ASQ (Anxiety) + DERS	0.087 0.136	0.40 0.20
Note: $F(4, 170) = 4.13, p < .01, R^2 = .069, \text{power} = .78$		

\*Significance at  $p < .05$

\*\*Significance at  $p < .01$

### Summary

Results of the study were reported in this chapter. Descriptions of the sample and instruments also were provided. All instruments were found to be reliable and acceptable for the study sample. The data analyses for each hypothesis also were presented and briefly discussed. PTSD severity was significantly lower among the sample of MHDRs than among two other trauma-exposed groups assessed in previous research as well as one non-trauma-exposed group. Mindfulness was not a significant predictor of PTSD, while ER and AAS (indicated by the absence of attachment anxiety) were significant negative predictors of PTSD. Highest level of education and informal debriefing after disaster response were also significantly related to PTSD in the study sample. None of

these factors, however, was a significant moderator of the relationships between the three predictor variables and PTSD. The study results supported a model of ER mediation for the relationship between AAS and PTSD.

## **CHAPTER V**

### **DISCUSSION**

This study investigated PTSD severity among MHDRs and explored ER, AAS, and mindfulness as potential predictors of PTSD within this group. Results were presented in Chapter IV. A discussion of these results is included in this chapter along with limitations of the study, implications of the study results, and suggestions for future research.

#### **Overview of the Study**

As the number of disaster events reported in the U.S. continues to climb, the need for skilled and prepared disaster responders grows increasingly salient. Mental health researchers have drawn attention to the heightened risk of trauma among disaster survivors and, more recently, among professional disaster responders. With an estimated 30-40% of survivors (Galea et al., 2005) and 10-20% of non-mental health professional responders (Berger et al., 2012) meeting diagnostic criteria for PTSD, there is no doubt that considerable mental health support is needed following disaster events. Yet the MHDRs who provide that support may be traumatized themselves by the direct and vicarious experience of disaster – a dilemma that, heretofore, has been largely overlooked in the literature.

Baum (2011) called attention to this “shared traumatic reality,” noting that the vulnerability to STS known by many mental health professionals who work with

trauma can be compounded for MHDRs by direct exposure to traumatic stimuli in the post-disaster environment. Palm et al. (2004), Rogers (2007), and Tosone (2011) supported Baum's (2011) argument, each calling for increased awareness of MHDRs' unique mental health needs and the risk of professional impairment if those needs go unmet. Only a few researchers have explored the needs of MHDRs empirically. Eidelson et al. (2003), Creamer and Liddle (2005), and Pulido (2012) demonstrated that some MHDRs experience STS along with increased stress, fearfulness, and problems in their personal lives as a result of their response work. The findings of all three of these empirical studies, however, come from MHDRs who responded to the same large-scale disaster (the 9/11 terrorist attacks), and only one of them (Creamer & Liddle, 2005) used a quantitative methodology. The current study aimed to extend this body of work by quantifying the problem of traumatic stress among MHDRs with diverse response histories and exploring factors related to internal coping that may help reduce the risk of trauma associated with mental health disaster response.

PTSD is characterized by the diagnostic triad of intrusion, numbing, and hyperarousal symptoms (van der Kolk, 1987) including pronounced disturbances in thought and mood (APA, 2013). It is the clinical diagnosis most commonly assigned to survivors of disaster trauma (Fullerton et al., 2004) and most frequently studied by disaster mental health researchers (Rubonis & Bickman, 1991). According to the avoidance model of PTSD, symptoms develop out of a protective avoidance of vivid and disturbing stimuli associated with a traumatic event (Thompson et al., 2011). If left untreated, this avoidance can lead to a state of emotional deregulation characterized by

distress, preoccupation, and disconnection from present-moment awareness. These consequences can prove detrimental and even dangerous for MHDRs who must be able to make quick decisions, provide accurate needs assessments, and offer emotional support to victims of a disaster.

ER, AAS, and mindfulness have each been linked to lower rates of PTSD among non-disaster trauma-exposed populations. Each of these factors contributes to effective internal coping, that is, reliance on oneself and resources within the self for emotional stability and healthy functioning in the midst of life disruption. ER is at the core of this process and seems particularly vital for MHDRs because it is central to clear reasoning, planning, perception, and problem solving (Chakraborty & Konar, 2009; Diamond & Aspinwall, 2003). Higher levels of ER have been associated with lower levels of PTSD severity (Diamond & Aspinwall, 2003); and conceptually it fits that aptitude in ER would break the avoidance cycle of PTSD that reinforces the numbing/flooding dichotomy.

AAS is indicated by the absence of attachment anxiety and attachment avoidance, which can develop when an individual is raised in an unpredictable, unsafe, or unresponsive environment (Bowlby, 1958). Attachment patterns typically persist throughout the lifespan and tend to determine how an adult will cope and adjust in novel or aversive situations, of which disaster would be an extreme example (Ainsworth & Bowlby, 1991). Studies indicate that AAS may lower susceptibility to long-term psychological distress (Declercq & Willemson, 2006) and predict effective emotional coping through ER (Lilly & Lim, 2013).



Mindfulness represents an individual's ability to act based on full awareness of internal and external stimuli in the present moment (Kabat-Zinn, 1994). Since disconnection from awareness and emotional numbing are characteristic of PTSD, it follows that those with greater mindfulness aptitude might be better able to combat the perpetuation of avoidance symptoms (Thompson et al., 2011). Empirically, higher mindfulness has been associated with self-regulated behavior, positive emotional states, and declines in mood disturbance and stress (Brown & Ryan, 2003). Mindfulness and ER have many conceptual overlaps and ER has been shown to mediate the relationship between AAS and mindfulness in a non-traumatized population (Pepping et al., 2013).

The purpose of the current study was to assess the severity of PTSD among MHDRs, to investigate whether ER, AAS, and mindfulness predict PTSD within this population, and to test a mediating model of PTSD using AAS and mindfulness as potential predictors and ER as a potential mediator. MHDRs recruited via word-of-mouth and social networking posts from across the U.S. completed instruments to measure the four study variables: PTSD, ER, AAS, and mindfulness. PTSD was measured using the IES-R (Weiss & Marmar, 1997), ER was measured using the DERS (Gratz & Roemer, 2004), AAS was measured using the Avoidance and Anxiety subscales of the ASQ (Feeney et al., 1994), and mindfulness was measured using the FFMQ (Baer et al., 2006). One-hundred seventy-two eligible participants completed the instruments and a demographic questionnaire.

Independent samples t-tests revealed that MHDRs scored significantly lower on PTSD severity than samples of burn victims and individuals who were dually diagnosed

with substance dependence and PTSD. Multiple linear regression analyses supported hypothesized relationships between AAS (indicated by the absence of attachment anxiety), ER, and PTSD but not between mindfulness and PTSD. ER was confirmed as a mediator for AAS in predicting PTSD severity. The results of each hypothesis are discussed below.

## **Discussion of Results**

### **Hypothesis 1**

Hypothesis 1 investigated the severity of PTSD among MHDRs and predicted that MHDRs' scores of PTSD severity would approximate those of other trauma-exposed populations. The results did not support hypothesis 1. MHDRs had a mean score of 6.76 ( $SD = 8.36$ ) on the IES-R. This mean is notably lower than cutoff scores used by Rash et al. (2008) (score of 22) and Fullerton et al. (2004) (score of 22.3) to indicate possible concern for PTSD diagnosis. Additional frequency analyses revealed that only 7% of participants ( $n = 12$ ) scored at or above a 22. Independent samples t-tests comparing mean total IES-R scores from the study sample to those from other trauma-exposed samples assessed in previous studies (Rash et al., 2008; Sveen et al., 2010) revealed that MHDRs not only scored lower than burn victims ( $M = 36.3$ ;  $SD = 26.1$ ;  $t(316) = 13.99$ ,  $p < .01$ ) and individuals with a dual diagnoses of substance dependence and PTSD ( $M = 45.4$ ;  $SD = 17.8$ ;  $t(240) = 22.97$ ,  $p < .01$ ), but also lower than a non-PTSD comparison group used in Rash et al.'s (2008) study ( $M = 21.5$ ;  $SD = 19.2$ ;  $t(222) = 7.93$ ,  $p < .01$ ). A significant correlation was found between participants' self-reports of PTSD symptoms since their first disaster response and PTSD scores on the IES-R ( $r = .182$ ,  $p < .05$ ),

suggesting that MHDRs are relatively well aware of any trauma symptoms they do experience. These symptoms, however, appear to be much less severe among MHDRs as a group than they are among other trauma-exposed groups. The finding that MHDRs also scored significantly lower on the IES-R than one non-trauma-exposed group indicates that MHDRs may actually be at lower risk for severe traumatization than members of the general population.

Subsequent analyses revealed that pre-disaster PTSD ( $r = .20, p < .01$ ) and depression ( $r = .16, p < .05$ ) were both significant predictors of IES-R scores in the current study. While regression analyses for research questions 2-4 controlled for these effects, they could not be controlled in the analyses for research question 1, so reported means may actually reflect preexisting symptoms.

It seems, then, that PTSD may be less of a concern among mental health professionals doing disaster response work than it is among other trauma-exposed groups. The fact that 7% of MHDRs scored at or above a common cutoff score for PTSD concern also suggests that MHDRs in this study likely exhibited lower PTSD prevalence than other disaster responders, among whom it is estimated that 10-20% meet diagnostic criteria for PTSD. There are several possible explanations for this. First, MHDRs are rarely considered “first responders” because they are not typically first on the scene of a disaster. Rather, MHDRs typically arrive days, weeks, or even months following the point of greatest impact (Spokane et al., 2011) and may therefore be less severely exposed to direct trauma from the disaster itself. Second, some MHDRs in this study included call center work and family/staff support as disaster responses. While these

activities are often part of a comprehensive disaster response effort, they require less direct involvement with the disaster-affected environment and may therefore be less likely to induce a severe trauma response. Third, participants in this study reported a wide range of time since last disaster response and inclusion criteria only required that they have responded within the past five years. If all participants had been assessed within one year since their last or most impactful disaster response, then PTSD prevalence and severity likely would have been higher. Fourth, by virtue of their training, MHDRs may have acquired skills that help them cope more effectively with potentially traumatizing situations than other trauma-exposed individuals as well as their non-mental health counterparts. Mean scores on the DERS were notably lower for the study sample ( $M = 54.56$ ) than for the normed sample ( $M = 79.30$ ), indicating fewer overall difficulties with ER among MHDRs. Likewise, mean scores on the FFMQ were higher for the study sample ( $M = 154.17$ ) than for the normed sample ( $M = 129.19$ ), indicating higher levels of mindfulness. Aptitude in both of these skills may have influenced overall severity of PTSD. Finally, mental health disaster response work is typically voluntary and a relatively small subset of mental health professionals choose to do this type of work. It is therefore possible that certain personal characteristics of those who self-select as MHDRs may lower their susceptibility to trauma-related symptoms.

It is also worth noting that scores on the IES-R may be somewhat context-dependent. MHDRs who are members of a disaster-affected community may find themselves compelled to respond, having less choice in the matter than MHDRs who volunteer for deployment from another community. Although additional research is

needed to explore the nuances between these two scenarios, it is reasonable to expect that someone who chooses to respond may experience trauma symptoms in a different way than someone compelled to respond in her or his home community. Additionally, analyses in this study could not account for individual differences in life experience that may have variably impacted individual MHDRs and contributed to PTSD severity. For example, a MHDR who is a parent might be more severely affected by a disaster in which children were harmed.

### **Hypotheses 2a-b**

Hypothesis 2a explored the relationships between each of the predictor variables (ER, AAS, and mindfulness) and PTSD. It suggested that each of these variables alone would predict a significant portion of the variance in PTSD scores with all relationships anticipated in a negative direction. The results only partially supported this hypothesis, as ER and AAS (indicated by the absence of attachment anxiety) were the only significant independent predictors of PTSD after controlling for covariates (DERS [ER]:  $F(3, 171) = 5.27, p < .01$ ; ASQ-Anxiety [AAS]:  $F(3, 171) = 4.93, p < .01$ ). Both relationships were in the predicted direction. Results showed that ER and AAS-Anxiety each accounted for a significant amount of variance in PTSD scores among MHDRs while mindfulness and AAS-Avoidance did not.

Hypothesis 2b went a step further to assess the relative contributions of each predictor to the overall variance in PTSD scores. It suggested that ER would account for more unique variance in PTSD scores than either AAS or mindfulness. Hypothesis 2b was not supported by the results. Rather, semi-partial correlation calculations revealed

that mindfulness accounted for the most unique variance in PTSD scores at 18.4% while ER accounted for just less than that at 18.2%. These were followed by AAS-Anxiety, which accounted for 11.6% of unique variance and AAS-Avoidance, which accounted for the least amount of variance at 4.0%.

Based on the analysis of main effects in hypothesis 2a, it seems that mindfulness alone does not have a strong relationship to PTSD among MHDRs and that ER and AAS – particularly attachment anxiety – each contribute more meaningfully to lower trauma symptom severity. These findings extend previous research on coping-related predictors of PTSD to a sample of MHDRs. Specifically, it appears that findings by Bardeen et al. (2013), whose results from a longitudinal study of 691 undergraduate female disaster survivors also pointed to a strong relationship between ER and PTSD, can be extended to this sample of MHDRs. The cross-sectional nature of the current results, however, prevent full generalization of Bardeen et al.'s (2013) findings, which suggested a reciprocal relationship between ER and PTSD rather than a one-way predictive relationship. Additionally, the finding that attachment anxiety (but not attachment avoidance) predicted PTSD is consistent with existing literature on attachment security. Other attachment researchers have suggested that heightened attachment anxiety increased the risk of psychological problems in adulthood (Sroufe, 2005) and trauma-related symptoms specifically (Declercq & Willemson, 2006). This is consistent with Bartholomew's (1990) model of adult attachment. Individuals who are high in attachment anxiety have more negative views of themselves and often struggle with using internal coping mechanisms effectively (Bartholomew, 1990; Mikuliner et al., 2003). When

placed in a disaster-affected environment where physical and social infrastructure may be severely damaged and social support lacking, it would make sense that those with higher attachment anxiety would suffer more (Bartholomew, 1990). Interestingly, it appears that MHDRs who are attachment avoidant may be more resilient to PTSD symptoms, supported by the finding that AAS-Avoidance actually diminished the predictive value of the overall regression model ( $\Delta R^2_{adj} = .004$ ). This is inconsistent, however, with the theoretical tenets of attachment, which would suggest that both attachment-related anxiety and attachment-related avoidance would exacerbate psychological symptomology. Additional research is needed to further understand the complex relationship between attachment anxiety, attachment avoidance, and PTSD symptomology among MHDRs.

The lack of a significant main effect for mindfulness implied that present-moment awareness may not, in fact, protect against the development of PTSD symptoms. Theoretically, mindfulness has been considered as a protective factor because it counteracts the avoidance symptoms of PTSD and helps to break the numbing/flooding cycle that perpetuates the traumatic response (Thompson et al., 2011). Chopko and Schwartz (2009), however, offered some evidence that aspects of mindfulness, specifically accepting without judgment, may actually be detrimental to posttraumatic growth. Although it cannot be concluded from results of the current study that mindfulness increases PTSD symptom severity, this may be one explanation for the lack of a significant main effect.

When entered in the full regression model, some of the dynamics between predictor variables and PTSD began to shift. Most notably, AAS (indicated by the absence of attachment anxiety and avoidance) no longer accounted for a significant amount of variance in PTSD severity (ASQ-Anxiety:  $\beta = .182, p = .11$ ; ASQ-Avoidance:  $\beta = -.047, p = .59$ ) while mindfulness did (FFMQ:  $\beta = -.296, p < .05$ ). ER's contribution to overall variance in PTSD severity remained significant in the full model (DERS:  $\beta = .315, p < .05$ ). This shift, along with the finding that mindfulness in the full model accounted for more unique variance in PTSD scores than any other predictor, including ER, indicated that something about the combination of mindfulness with the other predictor variables increased its predictive power. Intercorrelations for the study variables revealed significant relationships between FFMQ scores and each of the other predictors (DERS:  $r = -.761, p < .01$ ; ASQ-Avoidance:  $r = -.592, p < .01$ ; ASQ-Anxiety:  $r = -.389, p < .01$ ). Accordingly, high variance inflation factors (VIFs) were generated for ASQ-Anxiety (VIF = 2.44), FFMQ (VIF = 2.58), and DERS (VIF = 2.98). These elevated VIFs indicate multicollinearity, which may be to blame for the shifts in variable relationships within the full regression model. Specifically, mindfulness and ER are highly correlated at  $r = -.761$  and also have the highest VIFs, suggesting that considerable overlap in these two constructs may have artificially inflated the relative impact of mindfulness on the variance in IES-R scores. This is consistent with conceptual overlap between ER and mindfulness (Gratz & Roemer, 2004). This theory was tested by running follow-up regression analyses. When only DERS and FFMQ scores were entered as predictors of IES-R scores, both remained significant contributors to overall variance ( $F(4, 171) =$



5.46,  $p < .01$ ; FFMQ:  $\beta = -.257$ ,  $p < .5$ ; DERS:  $\beta = .394$ ,  $p < .01$ ). When only FFMQ scores and the two ASQ subscales were entered, however, FFMQ scores no longer significantly predicted scores on the IES-R ( $F(5, 171) = 3.45$ ,  $p < .01$ ; FFMQ:  $\beta = -.132$ ,  $p = .18$ ; ASQ-Anxiety:  $\beta = .293$ ,  $p < .01$ ; ASQ-Avoidance:  $\beta = -.058$ ,  $p = .51$ ). Thus, mindfulness only accounted for a significant amount of variance in PTSD scores when paired with ER. Perhaps the most plausible explanation for this pattern of results is a spurious relationship between mindfulness and PTSD severity wherein a third variable, ER, is actually driving the correlation. Based on previous research and the theoretical connection between mindfulness and ER, it is likely that mindfulness was actually predicting ER in the current study and that ER then predicted PTSD severity. Thus, the appearance of a relationship between mindfulness and PTSD severity was more likely attributable to ER.

### **Hypothesis 3**

Hypothesis 3 explored each of the numerous demographic factors included in the study survey as potential moderators of the regression main effects identified by testing hypothesis 2a. It predicted that four factors would significantly moderate relationships between each of the three predictor variables and PTSD severity: (a) total number of disaster responses, (b) previous trauma history, (c) perceived severity of disasters to which participants previously responded, and (d) proximity of disasters to participants' residences. These factors were selected because of the theoretical assumption that, at a certain level of trauma exposure, ER, AAS, and mindfulness would no longer predict PTSD severity and that trauma symptoms would arise regardless of a participant's ability

to use proactive internal coping strategies effectively. Results did not support hypothesis 3. Exploratory regression analyses revealed that none of the four predicted moderators were significantly related to IES-R scores when controlling for covariates. Three other factors, however, did significantly predict IES-R scores: highest level of education – master’s ( $F(3, 171) = 5.512, p < .01, \beta = .199, p < .01$ ), highest level of education – doctorate ( $F(3, 171) = 4.551, p < .01, \beta = -.157, p < .05$ ), and informal debriefing following disaster response ( $F(3, 171) = 4.310, p < .01, \beta = .152, p < .05$ ). None of these three factors yielded significant moderating effects with either DERS or ASQ scores. These results indicated that, among the study sample of MHDRs, level of exposure to trauma (disaster or otherwise) did not affect the impact of ER or AAS on PTSD severity and that these may still serve as protective factors even at high levels of direct trauma exposure.

The relationships between level of education and PTSD severity were interesting and unexpected. It seems that those participants whose highest level of education was a master’s degree experienced higher severity of PTSD symptoms, whereas those who went on to earn a doctorate in their respective fields experienced lower symptom severity. This finding could be interpreted in a few different ways. First, there may be components of doctoral-level training that specifically protect against PTSD development. Second, those who pursue a doctorate in mental health may have certain characteristics in common that help protect against PTSD. Third, 80% of participants who reported having earned a doctorate were either counselors ( $n = 24, 40\%$ ) or psychologists ( $n = 24, 40\%$ ).

There may be elements of the doctoral curriculum for these two fields that help protect against PTSD.

Additionally, participants who reported informal debriefing after at least one of their disaster responses actually experienced higher severity of PTSD symptoms. This finding contradicts the logic behind debriefing, the intent of which is usually to assuage the traumatic impact and facilitate post-traumatic adjustment. The key to this surprising finding may lie in the nature of the debriefing. Formal debriefing through a professional or organization did not significantly impact IES-R scores, whereas informal debriefing with friends or family did. Perhaps the act of sharing about details of the response experience with loved ones from whom MHDRs most likely cull their greatest support undermines the restorative value of debriefing. Also, the current study did not ask participants to weigh in on the perceived effectiveness of informal debriefing or the responses they received from their friends and family – factors that may readily influence the perceived utility of the debriefing process.

### **Hypotheses 4a-b**

Hypotheses 4a and 4b tested ER as a potential mediator between AAS and PTSD (hypothesis 4a) and between mindfulness and PTSD (hypothesis 4b). Because mindfulness was not found to be a significant predictor of PTSD in hypothesis 2a, hypothesis 4b could not be tested. Hypothesis 4a predicted that ER would better account for the established relationship between AAS and PTSD. The results supported hypothesis 4a and ER was confirmed as a mediator of AAS-Anxiety ( $F(4, 171) = 4.127$ ,  $p < .01$ ; ASQ-Anxiety:  $\beta = .087$ ,  $p = .40$ ; DERS:  $\beta = .136$ ,  $p = .20$ ). Validation of

hypothesis 4a lends support to the theory that ER skills grow naturally out of secure attachment relationships (Esbjörn et al., 2012; Lilly & Lim, 2013). Perhaps the most notable implication of this finding is the fact that ER can be trained, whereas AAS cannot (Ainsworth & Bowlby, 1991). If ER better accounts for the relationship between AAS and PTSD severity, then MHDRs who are insecurely attached and lack effective coping skills may be able to make up for this deficit, reduce their risk of PTSD, and maximize their role effectiveness by proactively learning (or being trained in) ER skills.

### **Limitations**

As the first to directly report on the severity of PTSD among MHDRs, this study helped shed light on the unique mental health needs of this population. It also provided new information about coping-related factors that influence the development and severity of PTSD symptoms among MHDRs. With the knowledge gained from the results of this study, MHDRs as well as those who employ and train them can begin to develop more proactive methods for preparing for disaster response work. As is the case with any form of research, however, there are some limitations to the methodology and application of results for this study. These are detailed in the following section.

Reliance on a web-based survey and self-report instruments may have influenced the reliability and validity of results. Participants were able to complete the survey at their leisure and the online medium did not allow for control over the survey duration or setting. Additionally, data gathered from self-report alone may have been affected by response bias and subjective interpretation of survey items. Although adjustments were made to the wording of some survey items based on feedback from the pilot study, there

was no way to ensure that all participants read and understood each item the same way. For example, the definition of disaster provided to participants as part of the study survey was open to interpretation. This led to a wide variety of disaster response descriptions – some of which might not have qualified as disasters if the provided definition were strictly interpreted (e.g., crisis calls, responses following a crime or death of a single individual). Some participants also chose to respond selectively to items on the survey. Although all 172 participants completed all items on the four survey instruments, a fair amount of demographic data was either missing or indecipherable. This may have reduced power for exploratory regression analyses used to identify potential covariates and moderators and increased the chance of Type II error. Of specific concern is the low number of participants who responded to a question about time since last disaster response ( $n = 28$ ). The fact that a majority (83.7%) of participants did not respond to this question left opportunity for MHDRs who had not responded within the past five years to complete the survey. Because symptoms of PTSD usually peak within one year of the related trauma event (CDC, 2012), participants who had not responded within recent years would have been less likely to report symptoms of PTSD, particularly at a level where diagnosis may be indicated. Thus, results on the IES-R may have been biased by data from MHDRs whose last or most impactful responses took place many years ago. It should also be noted that, when asked to provide details about individual disaster response events, participants were limited to 20 responses and were not given instructions about which to include (if more than 20) and in what order. As a result, the detailed

accounts of individual disaster responses may not accurately represent the sample's complete body of response work.

There were also limitations related to the study instruments and design. Due to the unpredictable nature of disasters, pre-test data was not available as a measure of baseline functioning for participants. The cross-sectional design limited data interpretation to correlations alone. Causality could not be inferred from any relationships found among the factors tested. Snowball sampling may also have limited the external validity of the findings as it is unknown if non-respondents may have differed systematically from respondents. Additionally, although the demographic questionnaire included questions about previous trauma experience and trauma work, participants were not asked to divulge details of past traumas or their own mental health treatment. As a result, little was known about the relative impact and severity of past traumas, previous trauma work, or participants' treatment histories, all of which may have affected study outcomes. It is possible, therefore, that the PTSD symptoms reported in this study also reflected trauma unrelated to MHDRs' disaster response work. The DERS was a relatively new instrument that lacked the psychometric support of some of the other measures and the two-factor nested model used for the ASQ had not been normed or used in studies beyond the factor analysis on which it was based (Karantzas et al., 2010). Similarly, Fischer's (2003) Disaster Scale Categories, which was used to collect data about the relative severity of disasters to which participants responded, was not validated or widely referenced. As a result, ratings of disaster severity varied widely and were often inconsistent between participants, even for the same disaster event. These issues may have limited the validity

and reliability of results. As mentioned in the discussion of hypotheses 2a-b, multicollinearity was a viable concern in data analyses for research questions 2-4, as was the heterogeneity of variance found in the ASQ-Anxiety data distribution. Multicollinearity clearly affected the results of hypothesis 2b and may have influenced other study results as well, making it unclear whether the reported effects can be fully attributed to each of the respective constructs or whether conceptual overlap in constructs, a potential spurious relationship between mindfulness and PTSD severity, and an overly-variable ASQ-Anxiety distribution may have confused some results. Lastly, the fact that the majority of the sample was Caucasian women may have biased scores on the DERS and other measures. Specifically, researchers have found that women are generally more likely than men to report use of ER skills and to employ specific ER strategies including reappraisal, problem-focused coping, and avoiding or distracting themselves from distressing situations (Nolen-Hoeksema, 2012).

Finally, there were a few limitations related to construct development and definitions. As outlined in Chapters I and II, it is quite difficult to distinguish between symptoms of PTSD and symptoms of STS among a dually exposed population such as MHDRs. Although this study sought to explore predictors of both, they were not isolated as separate variables due to the difficulties in differentiating their effects. Recent updates to the *DSM-5* included minor changes to the language and number of PTSD diagnostic criteria. Although the original diagnostic triad was still encompassed in the new standards, results from the IES-R were not directly analogous to the *DSM-5* diagnostic criteria for PTSD. Finally, instructions for completion of the IES-R also may have

influenced the validity of results. Participants were given standard instructions for completing the IES-R based on symptoms experienced within the past seven days. Symptoms of PTSD are known to peak, however, within one year after trauma exposure and to generally decrease after that. For some participants, especially those whose most recent response was years ago, scores on the IES-R may not have accurately captured all post-disaster response trauma symptoms they experienced. Additionally, instructions for the IES-R require that respondents reference a particular traumatic event (rather than multiple events or chronic trauma exposure). Thus, participants in this study were instructed to reference their most impactful disaster response based on the assumption that it would most heavily influence levels of traumatic stress associated with disaster response work. This is, however, an assumption. For some participants, other events may have weighed more heavily on their experiences of traumatic stress. Also, even those participants who had responded within the past five years may not have experienced their most impactful disaster response during that time, resulting in lower IES-R scores.

### **Implications for Counselors**

This study offers new insights and a quantitative research perspective on the risk of trauma among MHDRs as a result of dual exposure to direct and secondary traumatic stress during disaster response. Additionally, it extends a body of knowledge about factors related to internal coping and how they impact the development of trauma symptoms. Counselors' unique philosophical perspective on the conceptualization and treatment of mental health disorders based on wellness and a holistic understanding of the



individual makes this field particularly well suited for interpreting and applying the results of this study. Implications for the field of counseling are detailed in this section.

The results of this study indicate that MHDRs may be less susceptible to developing severe PTSD symptoms than other trauma-exposed groups, including non-mental health professional disaster responders. In fact, they may be less susceptible than the general population. If future research bears this out, it could support a growing niche for counselors as MHDRs and MHDR trainers. It is, however, vital to note that, despite a lower-than-average prevalence of severe PTSD symptoms among MHDRs, 7% of the participants in this study still met or exceeded symptom severity levels indicating cause for concern. Mental health support for these individuals is clearly indicated, at least in the short-term. The field should work to increase awareness about the risk of PTSD and related trauma symptoms among MHDRs. Using a wellness framework, counselors can begin to develop more intentional treatment modalities and training programs to prepare MHDRs for disaster response work.

Based on the results of this study and previous research on mindfulness and PTSD, caution should be used in incorporating mindfulness skills training into programs that prepare MHDRs and other disaster responders. There is some evidence that aspects of mindfulness practice, specifically accepting without judgment (Chopko & Schwartz, 2009), may actually exacerbate trauma symptoms. Although the current study did not find mindfulness to be a significant predictor of PTSD, it did not prove to be a protective factor among this MHDR sample. Counselors may want to re-evaluate how they are

using mindfulness techniques in preparing professional disaster responders and be more targeted in the types of mindfulness skills they train.

For counselors who train and prepare MHDRs and other disaster responders, results of the current study have important implications for the development of training programs. It appears that attachment security (specifically the absence of attachment anxiety) is a significant predictor of PTSD among MHDRs. This knowledge can be used to support assessment of attachment security and attachment styles for MHDRs-in-training and to promote education about how early attachment patterns influence effective coping in the midst of a disaster. MHDRs-in-training would benefit from learning about their own attachment patterns and reflecting on how those patterns may impact their experience of disaster response and their susceptibility to trauma. Additionally, specific skills in ER should be incorporated throughout training programs. MHDRs-in-training should be taught about the potential benefits of ER aptitude in mediating coping deficits related to attachment anxiety and reducing risk of severe traumatization. Together, knowledge, awareness, and concrete skill building may help mitigate traumatic stress and empower MHDRs to be more proactive in their own self-care and ethical practice.

### **Recommendations for Future Research**

Considerable research is still needed to better understand the experiences and needs of MHDRs. This study is intended as a stepping-stone to more advanced, targeted, and generalizable studies of responder trauma and the factors that protect against it. Several areas for future research are suggested.

First, additional quantitative studies are needed to more accurately assess the prevalence and severity of PTSD and other trauma-related symptoms among MHDRs. Use of a variety of assessment tools as well as different research designs would help support the case for PTSD prevalence in this population. Ideally, a longitudinal study including pre- and post-tests would provide more control over potential confounding variables, such as previous trauma exposure and time since last response, and would therefore offer more valid symptom assessment. A quasi-experimental study could also directly compare rates of PTSD symptoms between MHDRs and disaster responders from different professional backgrounds. Exploration of IES-R subscale scores and other methods of measuring PTSD severity may also paint a different picture of symptom prevalence. Similarly, replication of the current study with a wider variety of instruments and inclusion of subscales would add to the reliability and complexity of results.

In order to limit variability within the sample, this study excluded participants who were not U.S. citizens or licensed mental health professionals. Interestingly, many professionals who did not meet these criteria reached out to the researcher during the course of data collection. It seems that many of the individuals who are actually conducting mental health response work are not licensed in a mental health field. Rather, they are professionals from other occupational backgrounds or lay-responders with no professional affiliation. Future studies should tap these individuals as a resource and compare their experiences and the nature of their response work (through both qualitative and quantitative methods) to the experiences and work of licensed mental health professionals. Attention should be paid in future research to the demographic diversity of

MHDR samples. The sample in the current study was predominately Caucasian females – a bias that may have affected study results. Future researchers should include a more diverse sample in order to more deeply explore differences in gender, ethnicity, and other demographic factors. Additionally, international responders should be included in future research, especially considering Norris et al.'s (2002a) finding that only 25% of American disaster-exposed samples reported severe or very severe impairment compared with a much larger percentage of international samples. A logical next step would be to test the relationships among PTSD predictors in this study in a sample of non-mental health first responders to see if patterns can be generalized. If so, the results would have even wider-ranging implications for preparing law enforcement, firefighters, medical personnel, and other first responders for disaster work.

The relationships between level of education and PTSD uncovered in this sample were both surprising and intriguing, contradicting findings by Creamer and Liddle (2005) that level of education did not affect STS among their sample of MHDRs. Future research could explore these effects further through qualitative interviews with MHDRs who come from a variety of educational and professional backgrounds as well as investigation of the aspects of educational and professional background that occasion these differences. The results of the current study raised some questions about the individuals who gravitate to disaster response work and whether themes or patterns may exist in their personal characteristics or backgrounds. Understanding what motivates someone to become a MHDR may shed new light on this topic from a phenomenological perspective.

### **Conclusion**

This study assessed PTSD symptom severity within a sample of MHDRs and also explored ER, AAS, and mindfulness as predictors of PTSD among this group. Numerous personal and professional demographic factors also were considered. One-hundred and seventy-two MHDRs participated in this study. Data were analyzed using independent samples t-tests and multiple linear regression. Results did not support the hypothesis that MHDRs experience PTSD symptoms at similar rates of severity to other trauma-exposed populations. In fact, they indicated that MHDRs experience significantly less severity than some previously assessed groups. Results partially supported the hypotheses that ER, AAS, and mindfulness would each negatively and significantly predict PTSD among MHDRs and that ER would account for a greater proportion of unique variance than either of the other two predictors. Mindfulness was not a significant independent predictor, while ER and AAS (indicated by the absence of attachment anxiety) were significant negative predictors of PTSD severity. Highest level of education and informal debriefing after disaster response were also significantly related to PTSD severity in the study sample. None of these factors, however, was a significant moderator of the relationships between the three predictor variables and PTSD. Finally, the study results supported a model of ER mediation for the relationship between AAS-Anxiety and PTSD.

Implications for counselors include (a) a need to increase knowledge and awareness about trauma risk for MHDRs, (b) a call for re-evaluation of mindfulness training in MHDR preparation programs, (c) a recommendation to incorporate

assessment of and education about attachment patterns and their influence on coping and PTSD into MHDR training programs, and (d) a recommendation to incorporate ER skills training throughout MHDR training programs.

The current study supports further research into rates of PTSD and other trauma-related symptoms among MHDRs and other disaster responders. Additional qualitative and quantitative research is recommended using various measures and methodologies to broaden the understanding of MHDRs' unique experiences and needs. Finally, similar studies may be conducted with non-mental health disaster responders, international responders, unlicensed mental health responders, and more diverse samples to explore differences among these groups.

Although much remains to be explored in the work of mental health disaster response, this study has taken a first step by identifying a specific need among MHDRs and by opening the door for further exploration of protective factors and proactive coping strategies that may reduce their trauma risk, maximize their job effectiveness, and improve their quality of life and work.

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**APPENDIX A****INFORMED CONSENT AND RECRUITMENT SCRIPTS**

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## Institutional Review Board Approval



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Federalwide Assurance (FWA) #216

**To:** Allison Marsh Pow  
Counsel and Ed Development  
5725-K Bramblegate Road Greensboro, NC 27409

**From:** UNCG IRB



Authorized signature on behalf of IRB

**Approval Date:** 9/17/2013

**Expiration Date of Approval:** 9/16/2014

**RE:** Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)

**Submission Type:** Initial

**Expedited Category:** 7. Surveys/interviews/focus groups

**Study #:** 13-0328

**Study Title:** Coping with Catastrophe: Emotion Regulation, Adult Attachment Security, and Mindfulness as Predictors of Posttraumatic Stress among Mental Health Disaster Responders

This submission has been approved by the IRB for the period indicated. It has been determined that the risk involved in this research is no more than minimal.

### Study Description:

Mental health professionals who have previously served as post-disaster responders will be surveyed online as part of a correlational study that aims (a) to assess previously unknown rates of posttraumatic stress among this specific population and (b) to explore relationships between known predictors of posttraumatic stress within this population, including emotion regulation, adult attachment security, and mindfulness. The goal of this study is to better inform training programs that prepare mental health professionals to serve as disaster responders in order to maximize their role effectiveness and minimize potential risk.

### Regulatory and other findings:

- This research meets criteria for waiver of a signed consent form according to 45 CFR 46.117(c)(2).
- **Your study is contingent upon approval from another site (recruitment sites that require permission - per your response to stipulations). You will need to submit a modification at the time you receive that approval.**

### Investigator's Responsibilities

Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to submit for renewal and obtain approval before the expiration date. You may not continue any research activity beyond the expiration date without IRB approval. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.

Signed letters, along with stamped copies of consent forms and other recruitment materials will be scanned to you in a separate email. These consent forms must be used unless the IRB has given you approval to waive this requirement.

You are required to obtain IRB approval for any changes to any aspect of this study before they can be implemented (use the modification application available at <http://integrity.uncg.edu/institutional-review-board/>). Should any adverse event or unanticipated problem involving risks to subjects or others occur it must be reported immediately to the IRB using the "Unanticipated Problem-Adverse Event Form" at the same website.

Please be aware that valid human subjects training for all members of research team need to be kept on file with the lead investigator. Please note that you will also need to remain in compliance with the university "Access To and Retention of Research Data" Policy which can be found at [http://policy.uncg.edu/research\\_data/](http://policy.uncg.edu/research_data/).

## Long Consent Form (Pilot Study)

### UNIVERSITY OF NORTH CAROLINA AT GREENSBORO CONSENT TO ACT AS A HUMAN PARTICIPANT

Project Title: Coping with Catastrophe: Emotion Regulation, Adult Attachment Security, and Mindfulness as Predictors of Posttraumatic Stress among Mental Health Disaster Responders

Project Director: Allison Marsh Pow, MS/EdS, LPC, NCC

Faculty Adviser: Craig Cashwell, PhD, LPC, NCC, ACS

#### **What is the study about?**

This is a research project. Your participation is voluntary. The purpose of this project is to better understand factors that may influence the development of symptoms of posttraumatic stress disorder among mental health disaster responders as a result of their work in disaster response. *Posttraumatic stress disorder (PTSD)* is a clinical diagnosis defined by characteristic symptoms that may occur following exposure to a traumatic stressor. These symptoms include intrusive, unwanted thoughts or feelings, avoidance of unwanted thoughts or feelings, changes in mood and cognition, and increased arousal or reactivity (American Psychological Association, 2013). The results of this study have the potential to impact practices in training and preparing mental health professionals to perform disaster response work as effectively as possible and with as few negative outcomes as possible.

#### **Why are you asking me?**

In order to participate in this study, you must have served in a professional capacity as a mental health responder to a disaster event within the past **five years**. Disasters are sudden, acute, potentially traumatizing events that are collectively experienced. They may include natural events (i.e. tornadoes, hurricanes, earthquakes), technological events (i.e. transportation accidents, nuclear accidents, large-scale fires), or acts of terrorism and mass violence.

In order to participate you must also be an English-speaking U.S. resident and hold an active license in good standing in a professional mental health field (i.e., counseling, psychology, social work, or psychiatry). You must have responded to at least one disaster event in a professional capacity within the past five years.

#### **What will you ask me to do if I agree to be in the study?**

By consenting to participate in this study, you agree to provide the researcher with basic demographic and background information as it relates to your professional service as a mental health disaster responder. You also agree to complete and submit four online assessments. Completion of demographic and background information as well as completion of the four online assessments is estimated to take a total of 30-60 minutes.



Participation in this study will require you to recall aspects of past disaster response experiences, which may bring up strong emotional reactions for some participants.

**Is there any audio/video recording?**

Audio/video recording will not be used as part of this study.

**What are the dangers to me?**

The Institutional Review Board at the University of North Carolina at Greensboro has determined that participation in this study poses minimal risk to participants (pending IRB approval). Risks include potential emotional distress as a result of recalling past disaster response events. If you experience more than mild or temporary distress as a result of participating in this study, the researcher will be happy to provide referrals for appropriate professional support upon request. Additionally, you may find referral information for certified counselors in your area through the National Board for Certified Counselors at [www.nbcc.org](http://www.nbcc.org) or (336) 547-0607.

If you have questions, want more information or have suggestions, please contact Allison Pow at (704) 995-2585 or Dr. Craig Cashwell at (336) 334-3427. In non-emergency situations the researchers can be contacted via e-mail at [ampow@uncg.edu](mailto:ampow@uncg.edu) (Allison Pow) or [cscashwe@uncg.edu](mailto:cscashwe@uncg.edu) (Dr. Craig Cashwell) to answer any questions regarding this study.

If you have any concerns about your rights, how you are being treated, concerns or complaints about this project or benefits or risks associated with being in this study please contact the Office of Research Compliance at UNCG toll-free at (855)-251-2351.

**Are there any benefits to society as a result of me taking part in this research?**

As a result of participating in this study, you may contribute to a clearer understanding of the factors that influence the development of PTSD among mental health disaster responders, as well as the development of training programs designed to prepare mental health disaster responders to perform their work effectively while minimizing risk of traumatization.

**Are there any benefits to *me* for taking part in this research study?**

There are no direct benefits to participants in this study.

**Will I get paid for being in the study? Will it cost me anything?**

There are no costs to you or payments made for participating in this study.

**How will you keep my information confidential?**

All information will be transmitted through Qualtrics, a confidential survey website and, once received by the researcher, will be kept electronically in a password protected file. Participants will be identified using numbers only and will not be required to disclose their names. Study codes will not be linked to participants in any way. All information

obtained in this study is strictly confidential unless disclosure is required by law. Study-related electronic files will be kept for 7 years following completion of the study and will be destroyed at that time using Secure Empty Trash for Mac.

Absolute confidentiality of data provided through the Internet cannot be guaranteed due to the limited protections of Internet access. Please be sure to close your browser when finished so no one will be able to see what you have been doing.

**What if I want to leave the study?**

You have the right to refuse to participate or to withdraw at any time, without penalty. If you do withdraw, it will not affect you in any way. If you choose to withdraw, you may request that any of your data that has been collected be destroyed unless it is in a de-identifiable state.

**What about new information/changes in the study?**

If significant new information relating to the study becomes available which may relate to your willingness to continue to participate, this information will be provided to you.

**Voluntary Consent by Participant:**

By completing this survey, you are agreeing that you read, or it has been read to you, and you fully understand the contents of this document and are openly willing consent to take part in this study. All of your questions concerning this study have been answered. By completing this survey, you are agreeing that you are 18 years of age or older and are agreeing to participate.

- ☐ I have read the informed consent for this study and I agree to participate.
- ☐ I do not wish to participate in this study

### **Telephone Recruitment Script**

Hello, \_\_\_\_\_. My name is Allison Pow and I am a doctoral student in Counseling and Counselor Education at The University of North Carolina at Greensboro. I am conducting a study of predictors of posttraumatic stress among mental health professionals who respond to disaster. You may be eligible to participate in this study. If it's alright with you, I'd like to provide you with some additional information. Is this alright? [Will only proceed if "yes" response. If "no," will thank the individual for her/his time and offer my e-mail address for further communication if desired.]

I understand that you are a licensed mental health professional who has provided professional services in the aftermath of at least one disaster. Is this correct? [If "yes," will continue with the script. If "no," will thank the individual for her/his time and advise that these are necessary conditions for study eligibility, so he/she will not be eligible to participate.]

Have you responded to at least one disaster in a professional capacity within the past 5 years? [If "yes," will continue with the script. If "no," will thank the individual for her/his time and advise that he/she does not meet eligibility requirement to participate in the study.]

You are eligible to participate! Participation in this study will involve completion of a set of online assessments estimated to take between 30 and 60 minutes total. The results of this study will be used to inform training programs for mental health providers and disaster responders in an effort to improve the quality of services and to reduce risk to the professionals that provide them.

If you are interested in participating I can either give you the web address for the study assessments over the phone or I can send you an e-mail with the study link included. Are you interested in participating? [If "yes," will continue with script. If "no," will thank the individual for her/his time and offer my e-mail address for further communication if desired.]

Okay, would you prefer I give you the web address over the phone or send the link to you in an e-mail? [If by phone, will provide the web address at this time. If by e-mail, will request the e-mail address to which the participant would like the link sent.]

Thank you so much for your time! Please e-mail me if you have any questions or concerns. [Will provide e-mail address: [ampow@uncg.edu](mailto:ampow@uncg.edu)].

## **E-Mail Recruitment Script**

**Are you a licensed mental health professional?**

**Have you ever provided on-site mental health services to victims of a disaster?**

**If so, your help is needed for a study exploring the mental and emotional wellbeing of mental health disaster responders.**

Allison Marsh Pow, MS/EdS, LPC, NCC is a doctoral student in Counseling and Counselor Education at The University of North Carolina at Greensboro and she is conducting a study of predictors of posttraumatic stress among mental health professionals who respond to disaster. If you are a licensed mental health professional who has provided professional services in the aftermath of at least one disaster within the past five years, please consider participating in this study. Results will be used to inform training programs for mental health providers and disaster responders in an effort to improve the quality of services and to reduce risk to the professionals that provide them.

Those interested should go to the following link to complete the study survey. If you choose to participate, you will have the opportunity to enter a drawing for a \$100 Amazon gift card.

[http://survey.az1.qualtrics.com/SE/?SID=SV\\_5dXu4RGCHyREc5](http://survey.az1.qualtrics.com/SE/?SID=SV_5dXu4RGCHyREc5)

Thank you for your time and consideration!

*Please consider forwarding information about this study to any mental health professionals you know who may be eligible.*

### **Social Network Group Recruitment Posting**

Are you a licensed mental health professional?

Have you ever provided on-site mental health services to victims of a disaster?

If so, your help is needed for a study exploring the mental and emotional wellbeing of mental health disaster responders being conducted by Allison Marsh Pow, MS/EdS, LPC, NCC, a doctoral student in Counseling and Counselor Education at The University of North Carolina at Greensboro.

Please go to the following link for additional information:

[http://survey.az1.qualtrics.com/SE/?SID=SV\\_5duxu4RGCHyREc5](http://survey.az1.qualtrics.com/SE/?SID=SV_5duxu4RGCHyREc5)

The researcher can be contacted directly at [ampow@uncg.edu](mailto:ampow@uncg.edu). If you choose to participate, you will have the opportunity to enter a drawing for a \$100 Amazon gift card.

*Please consider forwarding information about this study to any mental health professionals you know who may be eligible.*

**APPENDIX B**  
**INSTRUMENTS**

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## Demographic Questionnaire

**Please respond to the following questions.**

- 1) What is your age? \_\_\_\_\_
- 2) What is your gender?      M      F      Other (please specify) \_\_\_\_\_
- 3) What is your race/ethnicity (select all that apply)?
  - Hispanic/Latino
  - Not Hispanic/Latino
  - American Indian or Alaska Native
  - Asian, Black or African American
  - Native Hawaiian or Other Pacific Islander
  - White
- 4) How would you best describe your current relationship status?
  - Single
  - Married
  - Divorced
  - Partnered and Cohabiting
  - Partnered Not Cohabiting
- 5) Are you a U.S. citizen? Y/N
- 6) Do you hold a current license in good standing in one of the following mental health fields: Counseling, Social Work, Psychology, or Psychiatry? Y/N (If no, not eligible for study and will be redirected to the end of the survey)
- 7) What is your highest level of education?      Master's      Doctorate
- 8) What is your professional orientation?
  - Counselor
  - Psychologist
  - Social Worker
  - Psychiatrist
  - Couples/Marriage and Family Therapist
  - Other (Please specify: \_\_\_\_\_)
- 9) How many years/months have you been working as a mental health professional?
  - Years \_\_\_\_\_ Months \_\_\_\_\_

- 10) Please estimate the amount of time (years/months) that you have spent working with at least one trauma-affected client? Years \_\_\_\_\_ Months \_\_\_\_\_
- 11) Have you ever undergone formal training to be a mental health disaster responder? Y/N
- 12) If you answered yes, please respond to the following questions about your training:
- How long ago did you complete your most recent training? Years \_\_\_\_\_ Months \_\_\_\_\_
  - Through what organization(s) have you received training? \_\_\_\_\_
  - Please briefly list any specific skills or treatment modalities in which you have received training related to disaster response work (e.g., Psychological First Aid). \_\_\_\_\_

*Disaster is defined as an acute, potentially traumatizing event that is collectively experienced. There are three categories of disaster: (a) Natural disaster – a disaster that occurs outside of human control, (b) Technological/human-caused disaster – a disaster that occurs as a result of human error or neglect, and (c) Terrorism – a disaster that occurs as a result of human intention to inflict fear and distress.*

- 13) Have you ever undergone formal training to be a mental health disaster responder? Y/N
- 14) If you answered yes, how long ago did you complete your most recent training? Years \_\_\_\_\_ Months \_\_\_\_\_
- 15) For how many disaster events have you provided on-site professional mental health services to individuals affected by the disaster? \_\_\_\_\_

Use the following disaster category scale to determine the category (DC-1 to DC-10) that best fits each disaster to which you have provided response services. Enter your response(s) in the last column of the table below.

**Definitions:**

**Scale** refers to the severity of destruction and distress a community or society experiences as the direct result of a disaster.

**Scope** refers to the extent or range of that destruction, whether impacting one area within a community, the entire community, or beyond.

**Duration** refers to the amount of time it takes for a community or society to return to normal functioning (or close to a relative baseline of daily functioning) following disaster impact.



Disaster Category	Scope, Scale, & Duration	Example
<b>DC-1</b> Everyday Emergency (EE)	Minor in scale, scope, & duration Minor in scope; Major in scale & duration Partial in scope; Minor in scale & duration	e.g., a single home house fire
<b>DC-2</b> Severe Emergency (SE)	Major in scope; Minor in scale & duration Major in scale & duration; Minor in scope	e.g., a house fire that spreads to multiple neighborhoods or a massive snowstorm
<b>DC-3</b> Partial Small Town (PST)	Major scale & duration; Partial scope - Town	e.g., an airline crash in or very near a small town
<b>DC-4</b> Massive Small Town (MST)	Major scale, scope, & duration - Town	e.g., a brush or forest fire that threatens to or actually does destroy an entire community
<b>DC-5</b> Partial Small City (PSC)	Major scale & duration; Partial scope – Small city	e.g., an airline crash in a small or medium sized city
<b>DC-6</b> Massive Small City (MSC)	Major scale, scope, & duration – Small city	e.g., an earthquake that affects the entire city or a bioterrorism event that impacts or threatens the entire city
<b>DC-7</b> Partial Large City (PLC)	Major scale & duration; Partial scope – Large city	e.g., an airline crash that occurred in New York City in November 2001, killing all on board and several on the ground
<b>DC-8</b> Massive Large City (MLC)	Major scale, scope, & duration – Large city	e.g., the 1906 earthquake and fires that destroyed much of San Francisco and seriously impacted nearly all residents of the city
<b>DC-9</b> Catastrophe (C)	Major scale, scope, & duration – Several population areas	e.g., the terrorist attacks of 9/11 that simultaneously involved the World Trade Center, the Pentagon, and the plane crash site in Pennsylvania
<b>DC-10</b> Annihilation (A)	Major scale, scope, & duration - Society	e.g., a massive nuclear attack involving weapons of mass destruction that targets enough population centers to constitute annihilation of a society

In the space provided in the table below, please list all of the disaster events you can recall for which you have provided professional services. Please provide as much information as you can about each event.

Brief description of the disaster event (e.g., type and location of disaster)	Time since event [years, months]	Duration of response (approximate amount of time you spent on-site) [months, weeks, days]	Estimated distance of the disaster site from your primary residence [<15 miles; 15-50 miles; 50-100 miles; 100-300 miles; >300 miles]	Disaster Category (DC) Rating [DC-1 to DC-10] (see rating chart below)
Ex. Hurricane Katrina, New Orleans, LA	8 years, 1 month	1 week, 2 days	>300 miles	DC-7

16) How long has it been since your most recent disaster response?

Years \_\_\_\_ Months \_\_\_\_

17) Did you ever experience symptoms of any of the following prior to your first disaster response? (Check all that apply.)

- ☐ Posttraumatic Stress Disorder
- ☐ Depression
- ☐ Other Anxiety Disorders (e.g., Specific Phobia or Panic)
- ☐ Substance Abuse or Dependence
- ☐ Other (Please specify: \_\_\_\_\_)

18) Have you experienced symptoms of any of the following since your first disaster response? (Check all that apply.)

- ☐ Posttraumatic Stress Disorder
- ☐ Depression
- ☐ Other Anxiety Disorders (e.g., Specific Phobia or Panic)
- ☐ Substance Abuse or Dependence
- ☐ Other (Please specify: \_\_\_\_\_)

19) Have you had any life experiences *other than your work responding to disaster* that you would consider traumatic? Y/N

20) For the following items, please consider what you believe to be your *most impactful* disaster response episode (i.e., the response that has had the greatest emotional and mental impact on you compared to all others).

- a. Did you experience any traumatic events (not related to disaster response) *prior to* your most impactful disaster response episode? Y/N
- b. Did you experience any traumatic events (not related to disaster response) *since* your most impactful disaster response episode? Y/N
- c. Did you have the opportunity to formally debrief or to tell your “disaster narrative” following your most impactful disaster response episode (i.e., through formal debriefing procedures set up by a response organization)? Y/N
  - i. If so, please *briefly* describe these debriefing procedures. \_\_\_\_\_
- d. Did you have any opportunities to debrief or to tell your “disaster narrative” informally following your most impactful disaster response episode (i.e., talking to family, friends, or associates about your experiences outside of any formal debriefing procedures)? Y/N
  - i. If so, please *briefly* describe your debriefing experiences. \_\_\_\_\_

21) Do you believe you have suffered from symptoms of traumatic stress as a result of any of your work with clients *outside the context of disaster response*? Y/N

22) If you had the opportunity, would you still be willing to provide professional services following a disaster? Y/N

If you answered no, please explain briefly (in a few sentences) what factors contributed to this decision. \_\_\_\_\_

\_\_\_\_\_

***Open-ended feedback questions included at the end of the survey for the pilot study:***

1. Approximately how long did it take you to complete the surveys?
2. Were there any survey items that you found confusing, unclear, or difficult to understand?
3. How could the survey be improved?

### Impact of Events Scale – Revised (IES-R)

**Below is a list of difficulties people sometimes have after stressful life events. Please read each item and then indicate how distressing each difficulty has been for you DURING THE PAST SEVEN DAYS with respect to your most impactful professional disaster response. How much were you distressed or bothered by these difficulties?**

Not at all = 0	A little bit = 1	Moderately = 2	Quite a bit = 3	Extremely = 4
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1. Any reminder brought back feelings about it.
  2. I had trouble staying asleep.
  3. Other things kept making me think about it.
  4. I felt irritable and angry.
  5. I avoided letting myself get upset when I thought about it or was reminded of it.
  6. I thought about it when I didn't mean to.
  7. I felt as if it hadn't happened or wasn't real.
  8. I stayed away from reminders of it.
  9. Pictures about it popped into my mind.
  10. I was jumpy and easily startled.
  11. I tried not to think about it.
  12. I was aware that I still had a lot of feelings about it, but I didn't deal with them.
  13. My feelings about it were kind of numb.
  14. I found myself acting or feeling like I was back at that time.
  15. I had trouble falling asleep.
  16. I had waves of strong feelings about it.
  17. I tried to remove it from my memory.
  18. I had trouble concentrating.
  19. Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart.
  20. I had dreams about it.
  21. I felt watchful and on-guard.
  22. I tried not to talk about it.
- 

The Intrusion subscale is the **MEAN** item response of items 1, 2, 3, 6, 9, 14, 16, 20. Thus, scores can range from 0 through 4.

The Avoidance subscale is the **MEAN** item response of items 5, 7, 8, 11, 12, 13, 17, 22. Thus, scores can range from 0 through 4.

The Hyperarousal subscale is the **MEAN** item response of items 4, 10, 15, 18, 19, 21. Thus, scores can range from 0 through 4.

Citations: Weiss, D.S. & Marmar, C.R. (1997). The Impact of Event Scale-Revised. In J.P. Wilson, & T. M. Keane (Eds.), *Assessing Psychological Trauma and PTSD: A Practitioner's Handbook*. (pp. 399-411). New York: Guilford.

Weiss, D. S. (2004). The Impact of Event Scale-Revised. In J. P. Wilson, & T. M. Keane (Eds.), *Assessing psychological trauma and PTSD: A practitioner's handbook* (2<sup>nd</sup> ed., pp. 168-189). New York: Guilford Press.

### Difficulties in Emotion Regulation Scale (DERS)

Please indicate how often the following statements apply to you by writing the appropriate number from the scale below on the line beside each item:

1-----	2-----	3-----	4-----	5-----
almost never (0-10%)	sometimes (11-35%)	about half the time (36-65%)	most of the time (66-90%)	almost always (91-100%)

- \_\_\_\_\_ 1) I am clear about my feelings.
- \_\_\_\_\_ 2) I pay attention to how I feel.
- \_\_\_\_\_ 3) I experience my emotions as overwhelming and out of control.
- \_\_\_\_\_ 4) I have no idea how I am feeling.
- \_\_\_\_\_ 5) I have difficulty making sense out of my feelings.
- \_\_\_\_\_ 6) I am attentive to my feelings.
- \_\_\_\_\_ 7) I know exactly how I am feeling.
- \_\_\_\_\_ 8) I care about what I am feeling.
- \_\_\_\_\_ 9) I am confused about how I feel.
- \_\_\_\_\_ 10) When I'm upset, I acknowledge my emotions.
- \_\_\_\_\_ 11) When I'm upset, I become angry with myself for feeling that way.
- \_\_\_\_\_ 12) When I'm upset, I become embarrassed for feeling that way.
- \_\_\_\_\_ 13) When I'm upset, I have difficulty getting work done.
- \_\_\_\_\_ 14) When I'm upset, I become out of control.
- \_\_\_\_\_ 15) When I'm upset, I believe that I will remain that way for a long time.
- \_\_\_\_\_ 16) When I'm upset, I believe that I'll end up feeling very depressed.
- \_\_\_\_\_ 17) When I'm upset, I believe that my feelings are valid and important.
- \_\_\_\_\_ 18) When I'm upset, I have difficulty focusing on other things.
- \_\_\_\_\_ 19) When I'm upset, I feel out of control.
- \_\_\_\_\_ 20) When I'm upset, I can still get things done.
- \_\_\_\_\_ 21) When I'm upset, I feel ashamed with myself for feeling that way.

1-----2-----3-----4-----5
almost never (0-10%)                      sometimes (11-35%)                      about half the time (36-65%)                      most of the time (66-90%)                      almost always (91-100%)
_____ 22) When I'm upset, I know that I can find a way to eventually feel better.
_____ 23) When I'm upset, I feel like I am weak.
_____ 24) When I'm upset, I feel like I can remain in control of my behaviors.
_____ 25) When I'm upset, I feel guilty for feeling that way.
_____ 26) When I'm upset, I have difficulty concentrating.
_____ 27) When I'm upset, I have difficulty controlling my behaviors.
_____ 28) When I'm upset, I believe that there is nothing I can do to make myself feel better.
_____ 29) When I'm upset, I become irritated with myself for feeling that way.
_____ 30) When I'm upset, I start to feel very bad about myself.
_____ 31) When I'm upset, I believe that wallowing in it is all I can do.
_____ 32) When I'm upset, I lose control over my behaviors.
_____ 33) When I'm upset, I have difficulty thinking about anything else.
_____ 34) When I'm upset, I take time to figure out what I'm really feeling.
_____ 35) When I'm upset, it takes me a long time to feel better.
_____ 36) When I'm upset, my emotions feel overwhelming.

The following items on the DERS are reverse-scored: 1, 2, 6, 7, 8, 10, 17, 20, 22, 24, 34

### Attachment Styles Questionnaire (ASQ)

**Show how much you agree with each of the following items by rating them on this scale:**

1 = totally disagree; 2 = strongly disagree; 3 = slightly disagree

4 = slightly agree; 5 = strongly agree; 6 = totally agree

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1. Overall, I am a worthwhile person.
2. I am easier to get to know than most people.
3. I feel confident that people will be there for me when I need them. (R)
4. I prefer to depend on myself rather than other people.
5. I prefer to keep to myself.
6. To ask for help is to admit that you're a failure.
7. People's worth should be judged by what they achieve.
8. Achieving things is more important than building relationships.
9. Doing your best is more important than getting on with others.
10. If you've got a job to do, you should do it no matter who gets hurt.
11. It's important to me that others like me.
12. It's important to me to avoid doing things that others won't like.
13. I find it hard to make a decision unless I know what other people think.
14. My relationships with others are generally superficial.
15. Sometimes I think I am no good at all.
16. I find it hard to trust other people.
17. I find it difficult to depend on others.
18. I find that others are reluctant to get as close as I would like.
19. I find it relatively easy to get close to other people. (R)



- 20. I find it easy to trust others. (R)
- 21. I feel comfortable depending on other people. (R)
- 22. I worry that others won't care about me as much as I care about them.
- 23. I worry about people getting too close.
- 24. I worry that I won't measure up to other people.
- 25. I have mixed feelings about being close to others.
- 26. While I want to get close to others, I feel uneasy about it.
- 27. I wonder why people would want to be involved with me.
- 28. It's very important to me to have a close relationship.
- 29. I worry a lot about my relationships.
- 30. I wonder how I would cope without someone to love me.
- 31. I feel confident about relating to others. (R)
- 32. I often feel left out or alone.
- 33. I often worry that I do not really fit in with other people.
- 34. Other people have their own problems so I don't bother them with mine.
- 35. When I talk over my problems with others, I generally feel ashamed or foolish.
- 36. I am too busy with other activities to put much time into relationships.
- 37. If something is bothering me, others are generally aware and concerned. (R)
- 38. I am confident that other people will like and respect me. (R)
- 39. I get frustrated when others are not available when I need them.
- 40. Other people often disappoint me.

*Items marked (R) are reverse-scored.*

### Five Facet Mindfulness Questionnaire (FFMQ)

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	very often or always true

- \_\_\_\_\_ 1. When I'm walking, I deliberately notice the sensations of my body moving.
- \_\_\_\_\_ 2. I'm good at finding words to describe my feelings.
- \_\_\_\_\_ 3. I criticize myself for having irrational or inappropriate emotions. (R)
- \_\_\_\_\_ 4. I perceive my feelings and emotions without having to react to them.
- \_\_\_\_\_ 5. When I do things, my mind wanders off and I'm easily distracted. (R)
- \_\_\_\_\_ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.
- \_\_\_\_\_ 7. I can easily put my beliefs, opinions, and expectations into words.
- \_\_\_\_\_ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted. (R)
- \_\_\_\_\_ 9. I watch my feelings without getting lost in them.
- \_\_\_\_\_ 10. I tell myself I shouldn't be feeling the way I'm feeling. (R)
- \_\_\_\_\_ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
- \_\_\_\_\_ 12. It's hard for me to find the words to describe what I'm thinking. (R)
- \_\_\_\_\_ 13. I am easily distracted. (R)
- \_\_\_\_\_ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way. (R)
- \_\_\_\_\_ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.
- \_\_\_\_\_ 16. I have trouble thinking of the right words to express how I feel about things. (R)
- \_\_\_\_\_ 17. I make judgments about whether my thoughts are good or bad. (R)
- \_\_\_\_\_ 18. I find it difficult to stay focused on what's happening in the present. (R)

- \_\_\_\_\_ 19. When I have distressing thoughts or images, I “step back” and am aware of the thought or image without getting taken over by it.
- \_\_\_\_\_ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
- \_\_\_\_\_ 21. In difficult situations, I can pause without immediately reacting.
- \_\_\_\_\_ 22. When I have a sensation in my body, it’s difficult for me to describe it because I can’t find the right words. (R)
- \_\_\_\_\_ 23. It seems I am “running on automatic” without much awareness of what I’m doing. (R)
- \_\_\_\_\_ 24. When I have distressing thoughts or images, I feel calm soon after.
- \_\_\_\_\_ 25. I tell myself that I shouldn’t be thinking the way I’m thinking. (R)
- \_\_\_\_\_ 26. I notice the smells and aromas of things.
- \_\_\_\_\_ 27. Even when I’m feeling terribly upset, I can find a way to put it into words.
- \_\_\_\_\_ 28. I rush through activities without being really attentive to them. (R)
- \_\_\_\_\_ 29. When I have distressing thoughts or images I am able just to notice them without reacting.
- \_\_\_\_\_ 30. I think some of my emotions are bad or inappropriate and I shouldn’t feel them. (R)
- \_\_\_\_\_ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
- \_\_\_\_\_ 32. My natural tendency is to put my experiences into words.
- \_\_\_\_\_ 33. When I have distressing thoughts or images, I just notice them and let them go.
- \_\_\_\_\_ 34. I do jobs or tasks automatically without being aware of what I’m doing. (R)
- \_\_\_\_\_ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about. (R)
- \_\_\_\_\_ 36. I pay attention to how my emotions affect my thoughts and behavior.
- \_\_\_\_\_ 37. I can usually describe how I feel at the moment in considerable detail.
- \_\_\_\_\_ 38. I find myself doing things without paying attention. (R)
- \_\_\_\_\_ 39. I disapprove of myself when I have irrational ideas. (R)

*Items marked (R) are reverse-scored.*

## APPENDIX C

### PERMISSION TO USE INSTRUMENTS

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## Permission to Use the IES-R



Allison Pow <ampow@uncg.edu>

---

### Request for Use of the IES-R

3 messages

**Allison Pow** <ampow@uncg.edu>

Thu, Aug 1, 2013 at 2:02 PM

To: daniel.weiss@ucsf.edu, hugos@lppi.ucsf.edu

Hello Dr. Weiss,

My name is Allison Marsh and I am a doctoral student in Counseling and Counselor Education at The University of North Carolina at Greensboro. I am working on my dissertation research, entitled Coping with Catastrophe: Emotion Regulation, Adult Attachment Security, and Mindfulness as Predictors of Posttraumatic Stress Among Mental Health Disaster Responders. I am interested in using the Impact of Event Scale - Revised for my study, and would like to request your permission to do so, as well as a copy of the full assessment.

Any other information you might be able to provide would be greatly appreciated! Thank you so much for your time.

Best,  
Allison  
--

Allison Marsh Pow, MS/EdS, LPC, NCC  
Doctoral Student  
Department of Counseling and Educational Development  
The University of North Carolina at Greensboro  
[ampow@uncg.edu](mailto:ampow@uncg.edu)  
Office: Ferguson Building 244

“One must always be prepared for riotous and endless waves of transformation.” ~Elizabeth Gilbert

---

**Weiss, Daniel** <Daniel.Weiss@ucsf.edu>

Thu, Aug 1, 2013 at 6:02 PM

To: Allison Pow <ampow@uncg.edu>

---

Daniel S. Weiss, Ph.D.  
Editor in Chief, *Journal of Traumatic Stress*  
Professor of Medical Psychology  
Department of Psychiatry  
University of California San Francisco  
San Francisco, CA 94143-0984  
P: 415 476 7557  
F: 415 476 7552  
Mail Code: UCSF Box 0984-F

**From:** Allison Pow [mailto:[ampow@uncg.edu](mailto:ampow@uncg.edu)]  
**Sent:** Thursday, August 01, 2013 11:03 AM


**To:** Weiss, Daniel; Sosa, Hugo  
**Subject:** Request for Use of the IES-R

[Quoted text hidden]

---

**2 attachments**

 **IES-R Use Issues November 2009.doc**  
76K

 **IES-R Form and Scoring.doc**  
40K

---

**Allison Pow** <ampow@uncg.edu>  
To: "Weiss, Daniel" <Daniel.Weiss@ucsf.edu>

Thu, Aug 1, 2013 at 6:38 PM

Thank you very much, Dr. Weiss!  
[Quoted text hidden]

## Permission to Use the DERS



Allison Pow <ampow@uncg.edu>

### Request for Use of the DERS

3 messages

**Allison Marsh** <ampow@uncg.edu>  
To: klgratz@aol.com

Tue, Jul 2, 2013 at 4:27 PM

Hello Dr. Gratz,

My name is Allison Marsh and I am a doctoral student in Counseling and Counselor Education at The University of North Carolina at Greensboro. I am working on my dissertation research, entitled Coping with Catastrophe: Emotion Regulation, Adult Attachment Security, and Mindfulness as Predictors of Posttraumatic Stress Among Mental Health Disaster Responders. I am interested in using the Difficulties in Emotion Regulation Scale for my study, and would like to request your permission to do so, as well as a copy of the full assessment.

Any other information you might be able to provide would be greatly appreciated! Thank you so much for your time.

Best,  
Allison  
--

Allison C. Marsh, MS/EdS, LPC, NCC  
Doctoral Student  
Department of Counseling and Educational Development  
The University of North Carolina at Greensboro  
[ampow@uncg.edu](mailto:ampow@uncg.edu)  
Office: Ferguson Building 244

*"One must always be prepared for riotous and endless waves of transformation." ~Elizabeth Gilbert*

**KLGratz@aol.com** <KLGratz@aol.com>  
To: ampow@uncg.edu

Sat, Jul 6, 2013 at 12:34 PM

Feel free to use the DERS. A copy is attached, as is a chapter summarizing its use in a variety of clinical and nonclinical populations.

Best,  
Kim

\*\*\*\*\*  
Kim L. Gratz, PhD  
Associate Professor  
Director, Personality Disorders Research  
Director, Dialectical Behavior Therapy Clinic  
Department of Psychiatry and Human Behavior  
University of Mississippi Medical Center  
2500 North State Street  
Jackson, MS 39216  
Office: (601) 815-6450  
Cell: (617) 688-0435  
Fax: (601) 984-4489  
[Quoted text hidden]

**2 attachments****DERS final version.pdf**  
11K**Gratz & Tull, in press (ER in TX Chapter).pdf**  
125K

---

**Allison Marsh** <ampow@uncg.edu>  
To: KLGratz@aol.com

Mon, Jul 8, 2013 at 11:09 AM

Thank you so much for your help!  
[Quoted text hidden]



## Permission to Use the ASQ



Allison Pow <ampow@uncg.edu>

### Availability of the Attachment Styles Questionnaire

6 messages

**Allison Marsh** <ampow@uncg.edu>  
To: judy@psy.uq.edu.au

Mon, Nov 12, 2012 at 2:14 PM

Hello Dr. Feeney,

My name is Allison Marsh and I am a doctoral student in Counseling and Counselor Education at The University of North Carolina at Greensboro. I am working on a research project exploring relationships between adult attachment style, mindfulness, and occupational self-efficacy among mental health disaster first responders in the U.S.. I am interested in the possible use of the Attachment Styles Questionnaire to assess for adult attachment style, and have a couple of related questions: 1) Is the ASQ available in public domain? I have thus far been unable to find it. 2) Would you ever consider providing a copy of the ASQ for use only as part of doctoral dissertation research?

Any other information you might be able to provide on accessing a copy of the ASQ would be much appreciated! Thank you so much for your time.

Best,  
Allison

--

Allison C. Marsh, MS/EdS, LPC, NCC  
Doctoral Student  
Department of Counseling and Educational Development  
The University of North Carolina at Greensboro  
[ampow@uncg.edu](mailto:ampow@uncg.edu)  
Office: Ferguson Building 244

"One must always be prepared for riotous and endless waves of transformation." ~Elizabeth Gilbert

**Judith Feeney** <j.feeney@psy.uq.edu.au>  
To: Allison Marsh <ampow@uncg.edu>

Tue, Nov 13, 2012 at 4:50 PM

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3 attachments

-  **ASQ-94.docx**  
158K
-  **ASQscoring.doc**  
23K
-  **ASQconfirmatory10.pdf**  
221K

Allison Marsh <ampow@uncg.edu> Tue, Nov 13, 2012 at 5:06 PM  
To: Judith Feeney <j.feeney@psy.uq.edu.au>

Thank you so much! This is incredibly helpful, and I very much appreciate your willingness to share it with me!

Allison  
[Quoted text hidden]

## Permission to Use the FFMQ



Allison Pow <ampow@uncg.edu>

### Request for Use of the FFMQ

6 messages

**Allison Marsh** <ampow@uncg.edu>  
To: rbaer@email.uky.edu

Tue, Jul 2, 2013 at 4:34 PM

Hello Dr. Baer,

My name is Allison Marsh and I am a doctoral student in Counseling and Counselor Education at The University of North Carolina at Greensboro. I am working on my dissertation research, entitled Coping with Catastrophe: Emotion Regulation, Adult Attachment Security, and Mindfulness as Predictors of Posttraumatic Stress Among Mental Health Disaster Responders. I am interested in using the Five Facet Mindfulness Questionnaire for my study, and would like to request your permission to do so, as well as a copy of the full assessment.

Any other information you might be able to provide would be greatly appreciated! Thank you so much for your time.

Best,  
Allison  
--

Allison C. Marsh, MS/EdS, LPC, NCC  
Doctoral Student  
Department of Counseling and Educational Development  
The University of North Carolina at Greensboro  
[ampow@uncg.edu](mailto:ampow@uncg.edu)  
Office: Ferguson Building 244

*"One must always be prepared for riotous and endless waves of transformation." ~Elizabeth Gilbert*

**Baer, Ruth** <rbaer@email.uky.edu>  
To: Allison Marsh <ampow@uncg.edu>

Tue, Jul 2, 2013 at 4:56 PM

Dear Alison

You're welcome to use the FFMQ, permission is not required. However I'm traveling and can't send it to you until after July 17. Please write again if you don't hear from me shortly after that

Sent from my iPad  
[Quoted text hidden]

**Allison Marsh** <ampow@uncg.edu>  
To: "Baer, Ruth" <rbaer@email.uky.edu>

Tue, Jul 2, 2013 at 4:58 PM

Wonderful, and thank you very much. Enjoy your travels!  
[Quoted text hidden]

## Permission to Reprint Fischer's (2003) Disaster Scale



Allison Pow <ampow@uncg.edu>

### Request to Reprint Material

1 message

**Allison Pow** <ampow@uncg.edu>  
To: ijmed.editors@gmail.com

Sat, Sep 28, 2013 at 1:28 PM

Dear Drs. Birkland and Lindell,

My name is Allison Pow and I am a doctoral student in Counseling and Counselor Education at The University of North Carolina at Greensboro. I am currently working on my dissertation research, entitled "Coping with Catastrophe: Emotion Regulation, Adult Attachment Security, and Mindfulness as Predictors of Posttraumatic Stress Among Mental Health Disaster Responders." I would like to request permission to reprint material published in the *International Journal of Mass Emergencies and Disasters* in 2003. Specifically, I'd like to reprint a disaster scale developed by Dr. Henry Fischer and published in his article entitled, "The sociology of disaster: Definitions, research question, and measurements continuation of the discussion in a post-September 11 environment" in Vol. 21 Issue 1 of the *International Journal of Mass Emergencies and Disasters* (p. 91-107). I would, of course, use appropriate citations.

I have tried to find current contact information for Dr. Fischer to request his permission directly, but have been unsuccessful. Because the article was published in your journal, I'm hoping you may have the copyright and the ability to grant permission. Please let me know if this reprint would be permissible. I have attached the table which I intend to use for your reference and review. Thank you for your help!

Best,  
Allison  
--

Allison Marsh Pow, MS/EdS, LPC, NCC  
Doctoral Student  
Department of Counseling and Educational Development  
The University of North Carolina at Greensboro  
[ampow@uncg.edu](mailto:ampow@uncg.edu)  
Office: Ferguson Building 244

"One must always be prepared for riotous and endless waves of transformation." ~Elizabeth Gilbert

**PDF of Fischer's Disaster Scale.pdf**  
64K



Allison Pow &lt;ampow@uncg.edu&gt;

## Reprint permission

2 messages

**Michael Lindell** <mlindell@tamu.edu>

Wed, Oct 2, 2013 at 11:21 PM

To: ampow@uncg.edu, "ijmed.editors" <ijmed.editors@gmail.com>

Allison:

You have our permission to reprint Henry Fisher's disaster scale. Best wishes for success in your dissertation.

Mike

Michael K. Lindell, Ph.D.

Professor, Landscape Architecture & Urban Planning

Senior Scholar, Hazard Reduction & Recovery Center

Adjunct Professor, Psychology

Co-Editor, International Journal of Mass Emergencies and Disasters ([www.ijmed.org](http://www.ijmed.org))

3137 TAMU Texas A&M University

College Station TX 77843-3137

Phone: (979) 862-3969 Fax: 845-5121

email: [mlindell@tamu.edu](mailto:mlindell@tamu.edu)

Web Site: <http://archone.tamu.edu/hrrc>

**Allison Pow** <ampow@uncg.edu>

Thu, Oct 3, 2013 at 8:40 AM

To: Michael Lindell <mlindell@tamu.edu>

Wonderful. Thank you for your help!

Best,

Allison

[Quoted text hidden]

--

Allison Marsh Pow, MS/EdS, LPC, NCC

Doctoral Student

Department of Counseling and Educational Development

The University of North Carolina at Greensboro

[ampow@uncg.edu](mailto:ampow@uncg.edu)

Office: Ferguson Building 244

## APPENDIX D

### PILOT STUDY METHODS AND RESULTS

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### **Pilot Study**

The primary purpose of the pilot study was to field test instrumentation and procedures for clarity and feasibility in order to maximize the accuracy and integrity of the full study. The first research question of the full study was analyzed using pilot study data in order to test procedures and the database to be used for the full study.

### **Participants**

The pilot study sample included 4 licensed professional counselors who reported delivering professional services on-site in the aftermath of at least one disaster in the past 3 years. All of the pilot participants were female and their average age was 44. Additional demographic information can be found in Table 1.

### **Instruments**

Participants completed a web-based survey that included the demographic questionnaire, the Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1997), the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), the Attachment Styles Questionnaire (ASQ; Feeney et al., 1994), and the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). Participants in the pilot study also were asked at the end of the survey to provide open-ended feedback about the duration of survey completion and about their overall experience completing the survey, including any items that were confusing or unclear.

Symptoms of PTSD were assessed using the IES-R. The IES-R contains 22 items rated on a 5-point Likert-type scale. Respondents rate representative statements related to trauma symptoms based on how distressing those symptoms have been in recent weeks,

from 0 (*not at all*) to 4 (*extremely*). The IES-R has three subscales that include *intrusion* (e.g., Any reminder brought back feelings about [the trauma]), *avoidance* (e.g., I felt as if [the trauma] hadn't happened or wasn't real), and *hyperarousal* (e.g., I was jumpy and easily startled). It requires reference to a specific traumatic event (Weiss & Marmar, 1997). Participants in the pilot study were instructed to consider trauma symptoms that resulted from their most recent disaster response episode. Beck et al. (2008) reported good internal consistency for the full scale at .95 and for all subscales (intrusion = .87-.94, avoidance = .84-.87, and hyperarousal = .79-.91). The IES-R also has good test-retest reliability (.89-.94 over a 6-month interval), evidence of concurrent validity with measures of anxiety and depression, and discriminant validity between individuals with and without a PTSD diagnosis (Beck et al., 2008; Weiss & Marmar, 1997).

ER was measured using the DERS. The DERS contains 36 items on a 5-point Likert-type scale that are rated from 1 (*almost never*) to 5 (*almost always*). It is meant to assess difficulties in ER. Therefore, a high score on the DERS reflects low overall ER. The DERS yields a total score as well as six scores for the following subscales: *goals* (e.g., When I'm upset, I have difficulty focusing on other things), *impulse* (e.g., When I'm upset, I lose control over my behaviors), *awareness* (e.g., When I'm upset, I acknowledge my emotions [Reverse scored]), *strategies* (e.g., When I'm upset, I believe that I will remain that way for a long time), and *clarity* (e.g., I have difficulty making sense out of my feelings). The DERS has marginal test-retest reliability (.57-.89 over a period of 4-8 weeks; the authors note a small sample size for this calculation; Gratz & Roemer, 2004), good internal consistency (overall score = .93; each subscale > .80), and



adequate construct and predictive validity (Gratz & Roemer, 2004). The DERS has been used liberally in empirical studies of ER (e.g., Ehring & Quack, 2010).

AAS was assessed using the ASQ. The ASQ contains 40 items measured on a 6-point Likert-type scale. Respondents rate items from 1 (*totally agree*) to 6 (*totally disagree*). It is meant to assess general attachment patterns and is not specific to a particular close relationship, as are many other measures of adult attachment (Stein et al., 1998). For purposes of this study, the first-order dimensions of the nested two-factor model will be used for analysis. These dimensions include *anxiety* (e.g., I find it hard to make a decision unless I know what other people think) and *avoidance* (e.g., If you've got a job to do, you should do it no matter who gets hurt). In the context of the two-factor nested model of the ASQ, AAS is defined as the absence of either anxiety or avoidance (Karantzas et al., 2010). The ASQ has strong test-retest reliability for the original five-factor model (.67-.78 over 10 weeks), good internal consistency for the two-factor nested model (.83 for avoidance and .85 for anxiety), and convergent validity with other attachment scales (Karantzas et al., 2010; Ravitz et al., 2010; Stein et al., 1998).

Mindfulness was assessed using the FFMQ. The FFMQ contains 39 items rated on a 5-point Likert-type scale. It assesses individual differences in the frequency of mindful states over time (Baer et al., 2008). Respondents to the FFMQ are asked to indicate the degree to which a statement in each item is true for them, from 1 (*never or very rarely true*) to 5 (*very often or always true*). The FFMQ has five subscales that include *observing* (e.g., I notice the smells and aromas of things), *describing* (e.g., I am good at finding words to describe my feelings), *acting with awareness* (e.g., I find myself

doing things without paying attention [Reverse scored]), *nonjudging of inner experience* (e.g., I think some of my emotions are bad or inappropriate and I should not feel them [Reverse scored]), and *nonreactivity to inner experience* (e.g., I perceive my thoughts and emotions without having to react to them). Baer et al. (2006) reported acceptable internal consistency for the full scale (.96) and for all five FFMQ subscales: (a) observing = .83, (b) describing = .91, (c) acting with awareness = .87; (d) nonjudging = .87, and (e) nonreactivity = .75. Baer et al. (2006) also reported good construct, convergent, and discriminant validity based on correlations between the FFMQ subscales and other constructs.

A demographic questionnaire was created by the researcher to collect relevant information including age, gender, race/ethnicity, professional affiliation, highest level of education, number of disaster events to which each participant has responded, history of previous trauma and/or STS, and length of time since last response. As part of the demographic questionnaire, participants were asked to provide a list of past disaster response experiences and details about those experiences including the perceived scale and scope of each disaster and the approximate distance between their residence and the disaster location. Additionally, participants were asked to indicate whether they would still be willing to provide professional services following a disaster and, if not, what factors led to this decision.

## **Procedures**

An online survey was constructed using Qualtrics<sup>®</sup> software. Permission to perform the pilot study was requested and approved by the University of North Carolina

at Greensboro's Institutional Review Board (See Appendix A). After approval was obtained, a recruitment e-mail was sent to a mental health professional who previously expressed interest in the study and who agreed to assist in recruitment. This individual then circulated the recruitment e-mail to other mental health professionals known to have responded to disaster events in the same geographic area within the past 5 years. The recruitment e-mail included a link to the web-based survey. The surveys took between 15 and 60 minutes to complete. Data were uploaded from Qualtrics<sup>®</sup> into an Excel spreadsheet and an SPSS database (SPSS, 2011).

### **Data Analysis and Overview of Results**

Although the size of the pilot sample is too small to draw any meaningful conclusions about relationships between the study variables, descriptive analyses were run on the demographic questions and research question 1 was analyzed. Results of these analyses are reported below.

First, frequencies and means were computed for the demographic questions. Participants reported working as licensed mental health professionals for an average of 11 years and spending an average of 6 years working with issues specific to trauma. All participants reported having worked with client trauma in the past. None of the 4 participants reported formal training as a mental health disaster responder. The average number of disaster responses reported was 2 and disaster category ratings (based on Fischer's [2003] Disaster Scale) ranged from DC-1 to DC-6, which was somewhat surprising given that the respondents all live in the same geographic area in mid-western Alabama and many of them responded to the same two disaster events – a mass shooting

at a local university in 2010 and a F4 tornado in 2011. Three of the four participants reported previous trauma (unrelated to disaster response work) and only one participant reported a belief that she had experienced trauma-related symptoms as a direct result of her disaster response work. None of the 4 pilot participants reported mental health symptoms since their first disaster response. Additional demographic information can be found in Table 1 below.

**Table 12*****Demographic Description of the Pilot Study***

<b>Variable</b>	<b>Mean (Range)</b>	<b><i>n</i></b>	<b>%</b>
Age	44.25 (31-58)		
Gender			
Female		4	100%
Race/Ethnicity			
Black or African American		2	50%
White		2	50%
Relationship Status			
Married		2	50%
Single		1	25%
Divorced		1	25%
Level of Education			
Master's		2	50%
Doctorate		2	50%
Professional Identity			
Counselor		4	100%
Time Working as a Licensed Mental Health Professional	10.75 yrs (5-16 yrs)		
Time Working with Trauma	6.67 yrs (1-15 yrs)		
Number of Disaster Responses	2 (1-3)		
Disaster Response Duration	5 mos (1 day-2 yrs)		
Disaster Scale (DC) Rating	3.875 (1-6)		
Proximity of Disasters to Primary Residence			
<15 miles		4	100%
100-300 miles		3	75%
Time Since Last Response	2.375 yrs (2-2.5 yrs)		
Symptoms Experienced Prior to Last Response			
Depression		2	50%
Other Anxiety Disorder (not PTSD)		1	25%

Descriptive statistics and Cronbach alphas were calculated for the four study instruments. Results support the reliability of these instruments with the target population. The sample size for the pilot study, however, is too small to generalize these results. Descriptive statistics and Cronbach alphas are listed in Table 2 below.

**Table 13*****Pilot Study Instrument Descriptive Statistics\****

<b>Instrument (Score Range)</b>	<b><i>M</i></b>	<b><i>SD</i></b>	<b><i>α</i></b>	<b># of items</b>
Attachment Styles Questionnaire				
Avoidance Scale (1-6)	3.14	0.79	0.89	16
Anxiety Scale (1-6)	2.87	0.73	0.88	13
Difficulties in Emotion Regulation (36-180)	43.75	6.80	0.87	36
Five Facet Mindfulness Questionnaire (39-195)	142.25	9.43	0.64	39
Impact of Event Scale - Revised (0-88)	1.00	2.00	1.00	22

\*Inadequate sample size

**Hypothesis 1.** Descriptive statistics were used to test hypothesis 1 regarding the percentage of MHDRs who reported PTSD symptoms at or above suggested cutoff scores for PTSD screening (mean IES-R scores above 24; Rash et al., 2008). With a mean of 1.00, all pilot participants reported total IES-R scores well below the referenced cutoff range of 22-44. Evidence from this small sample does support hypothesis 1 that less than 50% of MHDRs will report IES-R scores above 24. The pilot sample, however, is highly specific, homogenous, and not likely to be representative of the MHDR population.

## **Discussion**

Using a pilot sample of 4 MHDRs who each provided professional mental health services in the aftermath of at least one disaster in the past 3 years, research question 1 was analyzed to test procedures for the full study. Although results from the pilot data cannot be viably interpreted due to the small sample size, the following observations were made based on patterns that emerged during analysis of these data.

A resounding theme in the pilot data analysis is that IES-R scores, used to measure PTSD symptom severity among the pilot sample, were very low and minimally

variable. This is, in part, due to the small sample size. Some characteristics of the sample, however, also may have contributed to this analytical issue. Specifically, all 4 pilot participants resided and worked in the same geographical area when they completed the pilot survey and all responded to at least one of two major disasters that affected that area between 2010 and 2011. It is not surprising, considering the homogeneity of this sample, that there was little variability in IES-R scores. Additionally, scores on the IES-R indicated few to no symptoms of PTSD in this sample. Perhaps a byproduct of the severity and scope of the disasters to which participants responded, further investigation is needed to determine whether this finding is representative of MHDRs in other geographical areas and contexts. Also, it should be noted that 1 participant reported confusion about the directions for the IES-R in her survey feedback. Modifications will be made to these instructions for the full study to direct participants to consider the most impactful disaster to which they have responded rather than the most recent when completing the IES-R.

Although potential covariates could not be explored within the limited scope of the pilot study, some interesting patterns emerged from demographic data that should be revisited in the full study. First, 75% of the pilot participants lived within 15 miles of at least one of the disasters to which they responded and none of the participants had formal training as mental health disaster responders. Based on findings from previous research, it seems somewhat surprising that levels of PTSD were not higher among a group of participants who were not formally prepared for disaster response work and who were dually impacted by the disasters to which they responded. Second, the fact that several

participants in this sample responded to the same disasters allowed for informal review of the reliability of Fischer's (2003) disaster scale categories. This review revealed some variability in the way participants rated the scale, scope, and duration of disasters. For example, the same mass shooting event was rated a DC-2 by 2 participants and a DC-4 by another. The same tornado disaster was rated a DC-5 by 2 participants and a DC-6 by the other 2. If a sufficient number of participants responded to the same disasters, the full study will allow for more in-depth review of the reliability of Fischer's (2003) disaster scale, which has not previously been empirically examined. Finally, there seems to be some ambiguity in the way participants' assessed the duration of their disaster responses. Typically, immediate disaster response lasts for 2 to 4 weeks (ARC, 2012; V. Arnold, personal communication, September 10, 2012). At least 2 pilot participants, however, reported responses lasting over 1 year. This discrepancy may reflect the fact that several of the pilot participants were members of the disaster-affected communities they were treating. It will be informative to observe in the full study whether other MHDRs also perceive the duration of their responses as spanning months or even years. If so, the impact of this perception on mental health outcomes for MHDRs may warrant further exploration.



**APPENDIX E****ADDITIONAL ANALYSES**

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### Additional Analyses

#### *Multiple Linear Regression Analyses for Potential Moderators as Predictors of IES-R*

*Scores (N = 171)*

Potential Moderators	$\beta$	$p$ -value	$R^2$
No. of disaster responses	0.03	0.728	0.08
Pre-response traumatic event	-0.08	0.348	0.04
Post-response traumatic event	0.03	0.722	0.03
Perceived severity of disasters	-0.12	0.164	0.01
Distance from home	-0.14	0.095	0.02
Education: Master's	0.20	0.008**	0.07
Education: Doctoral	-0.16	0.037*	0.06
Informal debriefing	0.15	0.044*	0.06

Note:  $R^2$  indicates effect size for each standardized coefficient ( $\beta$ ).

\*Significance at  $p < .05$

\*\*Significance at  $p < .01$